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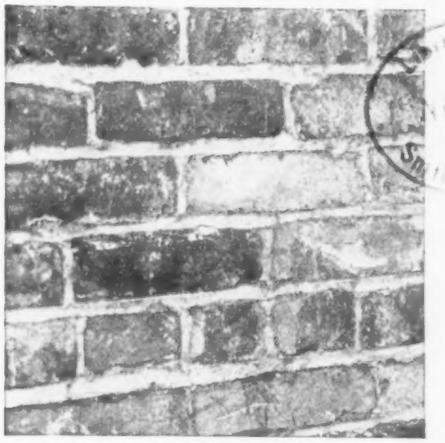

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The Gas Machinery Co.

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COAL GAS PLANTS WATER GAS PLANTS

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Cheap Gas— Who Wants It Most, the Consumer or the Gas Company?

The First Interested Merely to the Extent of a Few Dollars Annually—The Latter to the Extent of Greater Returns on Millions of Dollars of Investment

By S. G. ADDISON

We have seen a widespread demand for increased gas rates. These have not been altogether unaccompanied by protests and accusations of profiteering on the part of self-appointed champions of the people. There is a possibility that some might have gotten the impression that the gas manager sits awake nights concocting new schemes by which he can put across a lift in rates for his product; that he thinks more of high rates than he does of efficiency in manufacture and distribution.

It is time to exercise a certain degree of common sense.

Every Raise in Rates a Step Backward for the Gas Industry

There are and have been men in the gas industry of broad vision and vast ambitions. Their constant aim has been to reduce constantly the cost of producing and distributing gas. Tell this to the demagogue and he will laugh uproariously. Reason: gross ignorance and consequent skepticism.

"Catch the gas man thinking of the 'dear' consumer ahead of himself," he will protest, and therein betray the shallowness of his mind.

Such men as these have indeed given small thought to the interests of the consumer. The latter in their viewpoint is a detail. Their ambitions have been founded on selfishness, but since the attainment of their ambitions will necessitate a cheaper and easier mode of life for millions it is a good kind of selfishness to have.

The Gas Company a Comparatively Insignificant Industry in Its Territory

Important though it is in the life of its community, the gas company is generally a comparatively insignificant industry in the territory it serves. In the biggest city of the land, for instance, 26 Broadway as an address brings instant allocation. Thirty East Fifteenth Street, however, is a comparatively less known number.

To-day the gas company is merely a part of its community. If gas could be produced, distributed and sold even as high as 40 cents a thousand it is possible that it would be the hub of its whole community life. It is this vision that men of broad vision and vast ambitions in the gas industry see in their mind's eyes when they consider the feasibility of cheap gas. And they think not in terms of dollars of profit, but in terms of the importance of the industry of which they are a part.

Vast Possibilities Unfolded

If in one of the great cities of the land 40-cent gas were economically possible, what would it mean to the gas company?

It would mean, possibly with some improvement in gas-engine efficiencies, the utter rout of electric competition; would make the gas company, in fact, as much interested in the growth of the load of the electric company as the electric company itself, for surely the point would be more nearly approached where central-station development of power from gas engines rather than from steam boilers would become economically desirable.

It would mean wholesale use of gas for house heating. It would mean the relegation of the garbage and waste collection department of the city government from a place of almost supreme importance to an obscure and almost costless level.

It would mean a practical monopoly on the supply of all fuel for the city's industries.

Those are the things cheap gas would mean to the gas company. Contrast them to the one or two dollars less they would mean to the average consumer on his annual gas bill. Decide, then, who loses most when the gas rates go up. Figure what desperate straits the gas company must be faced with to impel it to take the great step backward that a rate increase means. There are two sides to every problem.

Growth of the Oxygen Industry in the United States and Its Relation to Oxy-Acetylene Welding and Cutting Processes

Processes for Obtaining Gases—Electrolytic Predominates—Why the Central Producing Plant Continues Main Source of Supply Despite Encouragement of Portable Plants by Producers

By HARRY L. BARNITZ, Ph. G.

Harry L. Barnitz, Ph. G., the author of this article is an internationally-known consulting engineer on oxygen and hydrogen, possibly the most widely known authority on the production and application of these gases in the country.

His entrance into this special field of work dates back a period extending over 16 years.

Dr. Barnitz was graduated from the Philadelphia College of Pharmacy in 1895, having taken a three years special course in theoretical, applied and analytical chemistry.

Many of the universities and colleges refer their technical problems on oxygen and hydrogen to him. He is consultant to the U. S. War Department, U. S. Bureau of Agriculture, Department of Soils, and has been consultant to several foreign governments and many large manufacturing corporations and numerous oxygen plants have been installed by him here and in foreign countries.

His services for the betterment of the industry are well known. Dr. Barnitz was appointed one of a committee of the three in 1911 to represent the low pressure manufacturers of oxygen and hydrogen at a very important meeting of the Interstate Commerce Commission held at Washington, D. C., April 11, 1911, relative to the formulating of the regulations and laws governing the transportation of these gases.

He also gave valuable assistance in the organization of the Manufacturers Compressed Gas Association, whose members represent the entire industry of all the various manufacturers of compressed gas in the United States

He also organized the Beseler Oxygen Company, of which he was president and manager, this company claiming to be the pioneer oxygen company in the U. S. The original company dates back 50 years. Prior to 1910 this company was the only company commercially manufacturing hydrogen and marketing in cylinders under low pressure, installing plants and doing research work in oxygen and hydrogen equipment

A great many improvements were devised and used that he suggested for plant installation and equipment.

As a technical writer on hydrogen manufacture and its applications he has written more on the subject than any other writer and reprints in book form of his writings on hydrogen from the various technical Journals are used as text books by the U. S. War Department in the balloon school at Fort Omaha, Neb.

He was presented in 1917 by the Library of Congress an honorary certificate on his various published articles on hydrogen production and its industrial application.

His pioneer association with the industry in the United States and in Europe with not only plant installation but experimental and commercial application of oxygen and hydrogen combines to identify him as foremost with every important advance in the industry.

Prior to the fall of 1906 the use of oxygen for cutting and welding purposes was extremely limited in scope. There were merely small installations at some industrial plants. These installations consisted of apparatus for the generation of oxygen from a suitable mixture of potassium chlorate and manganese dioxide, with apparatus for generating acetylene from calcium carbide. Welding and cutting torches completed the equipment.

In addition to these industrial installations there was also the Beseler Oxygen Company, who were marketing a very limited amount of oxygen in low-pressure cylinders containing 50 to 60 cu. ft., at a pressure of 225 lb. per square inch for welding and cutting, the greater part of their oxygen being consumed for stereopticon, medical and experimental purposes in various sized cylinders of smaller capacity. A few smaller companies were engaged in the manufacture of oxygen for medicinal and stereopticon purposes. The oxygen manufactured by these companies, with the exception of one company (S. S. White Dental Manufacturing Company), was sold compressed in various sized cylinders holding 10, 15, 25, 40, 50, and 60 cu. ft. of oxygen at a pressure of 225 lb. per square inch. On account of the low pressure used the large size tanks were extremely bulky for handling. The oxygen manufactured for this purpose was manufactured by the chlorate process, and as a consequence the price compared to the present price was very high. Prior to 1906 the price for oxygen gas ranged from 5 to 30 cents per cubic foot.

In the fall of 1906 Cecil Lightfoot, who had been up to that time connected with the British Oxygen Com-

pany of Great Britain, and Dr. Carl Von Linde, of Munich, Germany, came to this country for the purpose of interesting capital in the establishment of an oxygen plant on the Linde system for supplying oxygen compressed into cylinders and for the further purpose of extensively developing the use of the oxy-acetylene process. Cleveland capitalists were interested in the project. The Linde Air Products was organized in 1906 under the laws of the State of Ohio. Steps were immediately taken for the establishment of a plant at Buffalo, and in 1907 a plant having a capacity of 750,000 cu. ft. of oxygen per month was completed. At the same time steps were taken to manufacture apparatus for the use of the gas, marketing of the apparatus and demonstrating its applications.

Development of the Welding Torch

The American rights were acquired for the manufacture, sale and use of a welding torch on the Fouche principle. At about this time the Linde Company also began an active campaign of introducing the cutting process. The establishment of a plant at Buffalo saw the first earnest beginning of the commercial production and use of oxygen in connection with oxy-acetylene and related processes. The Linde Company was first to make use of high pressure cylinders for the transportation of oxygen on a large scale,—that is, cylinders capable of containing a certain definite amount of oxygen at 1800 lb. pressure. The use of high pressure cylinders materially reduced the size and weight of the cylinder as compared with the cylinder of the low pressure type for pressures up to 225 lb. which before this time were exclusively used.

Until 1909 the Buffalo plant of the Linde Air Products Company was the only commercial source of oxygen in the United States. In the meantime, however, other companies came into existence who manufactured welding torches of various designs and cutting torches. Chief among these companies was the Davis-Bournonville Company, who were considered the pioneers in the introduction of welding and cutting equipment and who acquired in 1906 the American rights to a patented welding torch which was in use in France. They also marketed a cutting device which was attached to the welding torch converting the welding torch into a cutting torch. More particularly, the device was simply a means of supplying to the torch a separate jet of oxygen.

Reduction in Freight Charges Through Lighter Cylinders

Due to the fact that oxygen was not available in all districts of the United States, development of the process was not so rapid as might be expected of such a revolutionary process and one having such plainly to be seen merit. In addition, the price of the oxygen was high (2½ to 3 cents per cubic foot), the transportation charges borne by the customer being heavy. The cylinder used by the Linde Company for transporting the gas, in spite of the high pressure employed, was excessively heavy, weighing in the neighborhood of 130 lb. per 100 cu. ft. filled. The present practice is to use 100 cu. ft. cylinders having the same capacity but weighing not more than 85 lb. or less and 200 cu. ft. cylinders weighing approximately 140 lb. filled. Thus the freight charges per foot of gas have been materially reduced by the reduction in the weight of the containers. To escape the excessive cost of obtaining oxygen from Buffalo combined with the difficulty of obtaining gas promptly, apparatus was developed during this period which enabled the user to manufacture his own supply of gas. The companies manufacturing welding and cutting apparatus were the prime movers in introducing this individual oxygen generating apparatus, as the process appeared to furnish an easy solution to the problem of securing oxygen and as a consequence furthered the sale of welding and cutting equipment. The process employed was the decomposition of potassium chlorate. In spite of the process's early success its general use was not developed due to the fact that after 1910 other oxygen plants were erected which had the effect of reducing freight charges and further that the base price of oxygen decreased and as a consequence it gradually became cheaper to buy the oxygen from the large producing plants.

In 1908 and 1909 Herman Falk, president of the Falk Company, and Henry Harnischfeger, an official of the Pauling-Harnischfeger Company of Milwaukee, purchased from the L'Oxhydrique Internationale of Brussels certain patents covering apparatus for the production of oxygen and hydrogen by electrolysis of water, welding apparatus for using oxygen and hydrogen and the Jottrand patents for gas cutting apparatus. The American Oxhydric Company was organized and in 1909 began erection of a plant in West Milwaukee for the production of oxygen and hydrogen by the electrolytic process. They also manufactured the generators used for the gas production, and the welding and cutting apparatus to be used in connection with oxygen and hydrogen. The plant was finally completed in the late fall of 1910 and had a maximum capacity of approximately 270,000 cu. ft. of oxygen per month with, of course, double that amount of hydrogen. During 1910 the company made an active effort to introduce what was called the oxy-hydric process, i. e., making use of oxygen in connection with hydrogen for the combustible element. They attempted to introduce the process into industrial concerns in this country without, however, a great deal of success. The extended use of this process was hindered by the same causes that held back the development of the oxy-acetylene process, namely, the high cost of gas and the necessity of long shipments with consequent high transportation charges due to the fact that this was the only plant capable of supplying the essential gas, i. e., hydrogen. The process did meet with some success in the environs of Milwaukee. The American Oxy-hydric Company from 1908 to 1912 owned the sole American and Canadian rights to the Jottrand patents and as owners notified the people manufacturing cutting torches and the trade of their ownership. No suit, however, was brought, and the various manufacturers of oxy-acetylene cutting apparatus continued to infringe these patents as claimed by the American Oxyhydric Company. This condition continued from 1908 until the summer of 1912 when the company and all its assets including their patented rights were purchased by the Oxweld Acetylene Company of Chicago and New York.

The Oxweld Acetylene Company either conveyed or sold the Jottrand patents on December 5, 1913, to Jesse J. Rix, who conveyed or sold them to the Linde

Air Products Company, January 3, 1914. Within a few weeks after obtaining the Jottrand patents, the Linde Air Products Company began suit for infringement of these patents against the Morse Dry Dock & Repair Company. This suit was tried in the Federal Courts, held in Brooklyn, and the Linde Company lost the suit. They appealed the suit and again a decision was rendered, on December 19, 1917, by the U. S. Circuit Court of Appeals in favor of the defendant.

In 1910 the second Linde plant started in operation at East Chicago, Ind., with a capacity the same as the Buffalo plant or 750,000 cu. ft. per month.

In 1911 the Linde Company erected plants at Trafford, Pa., and Elizabeth, N. J. These plants also had a capacity of 750,000 cu. ft. per month each. At the end of 1911 the Linde Air Products Company was supposed to be producing and disposing of 3,000,000 cu. ft. of oxygen per month. During the peirod 1907 to 1910 the price of oxygen was gradually reduced from its former price to 3 and 2½ cents down to 1¼ cents dependent on the customer's requirements. This price reduction and the fact that oxygen could be obtained in a number of locations gave great impetus to the use of the process. From 1910 to 1917 the price was further reduced.

By-Product Oxygen

In 1911 the Davis Oxygen Company was organized by Mr. Davis of the Davis-Bournonville Company. The first plant was located at Harrison, N. J., adjacent to the General Electric Company. The Davis Oxygen Company made use of the by-product oxygen of the electrolytic plant operated by the General Electric Company compressing the oxygen at 300 lb. in 100 cu. ft. cylinders. Installation of this plant was followed by plants at Chicago in 1911 and Cleveland in 1912. These two plants, however, made use of the Tesse de Motey process. The production of these plants was doubtful and the Cleveland plant was never put to extended use. It is estimated that the Harrison plant had a capacity of 150,000 ft. of oxygen per month, the Chicago plant 300,000 cu. ft. a month and the Cleveland plant approximately the same. On account of the high cost of production, the attempt to use low pressure cylinders, and due to lack of cylinders, the company did not make satisfactory progress, although they were considered as a serious competitor by the Linde Company. In 1912 the Davis Oxygen Company suddenly went out of business and it is understood that many of their assets were taken over by the Linde Company. The plants were immediately dismantled. Taking over the Davis interests by the Linde interests was consummated about the time carbide interests secured control of the Linde Company and at the time the Oxweld Company took over the American Oxyhydric Company. In the summer of 1912 and after this change the Linde Company was supplying practically all of the oxygen used in the United States, with the exception of small amounts supplied by the International Oxygen Company, Tariffville Oxygen Company and Lennox Chemical Company. That year also steps were taken to install additional plants by the Linde Company.

The International Oxygen Company was incorporated in 1911 and in 1912 completed the erection of a plant in Newark for supplying oxygen compressed in cylinders. The plant of the International Oxygen Company has an approximate capacity of 450,000 cu. ft. of oxygen per month. Other oxygen producing plants have been installed by this company in Verona, Pa., and College Point, L. I., N. Y.

At Tariffville, Conn., a plant was installed for the production of Electrolytic oxygen and hydrogen gases, the oxygen to be sold compressed into cylinders. The plant is still in operation and is supposed to have a capacity of 150,000 cu. ft. of oxygen per month.

In 1913 the Burdett Manufacturing Company was organized. Since its incorporation plants for supplying oxygen have been installed in thirteen principal cities.

In 1914 the Superior Oxygen Company was organized at Pittsburgh, and began the erection of an oxygen producing plant in Pittsburgh, they operating under the American rights for the Hildebrand liquid air process. Since its organization, plants have been installed in five different cities.

The Air Reduction Company was incorporated November 26, 1915. This company acquired the American rights for the Claude liquid air process from France. Before they constructed any plants for the production of oxygen by the Claude process, they acquired the controlling interest in the Superior Oxygen Company. This acquisition gave them the immediate facilities to enter the field as a big competitor of the Linde Company and other smaller interests. The first plant of the Claude process was installed by them in Philadelphia, Pa., and completed in July, 1914. They have, at the present time, fourteen plants in operation, which include the Superior Oxygen Company plants, and have thirteen plants in the course of construction.

The Pintsch Compressing Company erected a liquid air plant in Jersey City, N. J., in the spring of 1916, claiming the process as their own. They contemplate erecting other plants in various cities.

At the present time the Linde Company have plants in twenty-eight cities.

Electrolytic Process Predominates

Twenty-five of their plants have been erected since 1912.

At the present time there are forty-five independent plants, all using the electrolytic process and three companies using liquid air process, with forty-three plants in operation.

Oxygen can now be obtained from producing plants located in fifty-four cities in the United States and in many of the cities there are two or more plants. The development of the oxy-acetylene and related processes have coincided exactly with the installation of oxygen producing plants. The base price of oxygen has been materially decreased and the freight charges have been practically eliminated, because of the number of local plants. The decreasing cost of operation has been the most potent factor in furthering the use of the oxy-acetylene process. Other causes have been decreasing the weight of the shipping cylinders, making them more convenient for handling, and as well decreasing cartage and freight charges; general employment of only high pressure tanks and the rise in purity of oxygen with the consequent reduction in the amount required for a given amount of work, and a stilll further economy effected in some instances by the consumers installing their own generating equipment for the production of oxygen where electric power can be obtained at a low price.

We Become Solicitous in Regard to John Jones

Yesterday We Paid Him Two Dollars a Day and Felt Privileged to Swear at Him, at Will, and Even Strike Him, and He Stood for It—To-day We Assume a Different Attitude Towards John Jones, and Even at That Cannot Hold Him

By EDWIN DEAN

A few years ago—a very few—our main interest in John Jones was in keeping his wage high enough at least to feed him well enough to enable him to do our work. We were not interested very much in whether he stayed with us very long or not. The ships were bringing more like him over every day, and we didn't even have to go out of our way to bring him to our works. The *padrone*, or the employment agent if we prefer to style him that, attended to such details for us. A labor turnover even of 50 per cent a year would not have bothered the most conservative manager. We had not yet learned what each employee replacement cost us.

To-day the ships are not bringing them over to any extent. But even if they were our present solicitude for John Jones would not diminish. We have learned the cost of labor turnover.

The Biggest Problem

It is a big problem to get John Jones to come to us in sufficient numbers. There are too few of him.

But great and vexatious as this problem is, it pales in importance besides that of holding him once we have gotten him.

An Effort Fraught With Many Possibilities of Discouragement

We have raised John Jones' pay to unheard-of levels, and even if the day comes when supply exceeds demand it is questionable if we will ever again lower it radically. If we consider doing so we will sharpen our pencils somewhat in a comparison as to losses due to labor turnover as contrasted to economies to be effected by a lower wage scale.

We have racked our brains for means to win John Jones' good-will and enhance his contentment.

We build and maintain excellent schools for the education of his children.

We provide him with housings more sumptuous even than he conceived in his wildest dreams.

We give him a share in the profits.

There is no limit to which we will not go.

To Whom Does John Give the Credit?

Yet we do not seem to be succeeding in wedging ourselves into his affections. Why?

For generations John has been accustomed to putting us in a different class than himself, of not regarding us as human.

Self-examination would tell him that he sometimes was actuated by good impulses; that in his heart there were moments when the interests of his neighbor were of more importance than his own.

But John distrusted us; still distrusts us. He hasn't been accustomed to solicitude on our part towards his welfare. He looks beyond us for a reason for our recently begotten good-will towards him.

There is the politician, an opportunist in the highest degree.

He likewise does not credit us with any feelings of good-will to our fellow man. But he is more intelligent than John Jones. He can at least find a reason for our lately-born solicitude towards our workers. There's money in it. Contented workers, even dearly bought, are a good investment.

Does he explain this to John? He does not. It must be remembered he is an opportunist.

He lets John think he owes his present status to his vote. The modern trend towards employee welfare, he lets John know, is really compelled by government; that John by putting the right man in power has brought all these blessings upon himself.

These are but two of many reasons why John Jones is not as grateful to us as we think he should be.

No matter how great our efforts, we are not going to reverse the picture of ourselves that has photographed itself in the mind of John Jones. To win his interest and whole-hearted co-operation is going to be a long-drawn-out task. But we have made a beginning—none too soon—and results will begin to be felt, gradually of course, but perhaps sooner than we can now foresee.

Points Out Lines of Attack Chemist May Follow to Conserve Fuel

Prof. Edmund O'Neil Reminds San Francisco Engineers of Fuel Conservation Possibilities Lying in Proposition to Supply Pure Oxygen for Combustion in Furnaces

You have perhaps heard the story of the Frenchman's method of hunting lions in the Desert of Sahara, declared Prof. Edmund O'Neil, of the American Society of Mechanical Engineers, before the joint meeting of the Engineering Societies held at the Engineers' Club, San Francisco, Thursday, Sept. 26, 1918. He describes it as follows: The Desert of Sahara is composed of sand and of lions. You take a sieve and sift the desert. The sand flows through the sieve and the lions remain. They can then be placed in a bag and carried home.

Everything is very simple from a certain standpoint, whether it is hunting lions or conserving fuel. But to carry these ideas out practically—ah! there's the rub.

This is a period of suggestions. To those of us who have had occasion to listen to the ideas of men who have invented methods of ending the war by machines or devices that work on the surface of the earth, or in the air above us, or in the depths of the sea, nothing seems impossible. One of them came to

see us a short time ago with a method that was ideal for conserving fuel, and would render this symposium unnecessary. The problem was solved. He told me that he had discovered a material in Placer County that when placed in water would cause the water to boil. This applied to a steam boiler would run an engine. After this material had done its work in generating steam it was to be taken to some tropical climate, there dried out by the direct heat of the sun, and the desiccated material brought back again, put under the boiler, moistened, more steam generated, and the cycle repeated unendingly.

Two Uses for Fuel

Fuel is used for two purposes: primarily, for the production of heat; secondarily, for production of power. We can conserve fuel in two ways, either by obtaining a larger proportion of the theoretically available heat by improved devices and by eliminating wastage, loss by radiation, etc., or we can obtain the required power by use of other forms of energy than heat units. We are all familiar with some of the methods employed for using the powers of nature. The tides, the waves, the winds, running or falling water, the direct heat of the sun may all be used for conserving fuel. Wood is an abundant fuel on this coast, but it is difficult to transport and uneconomical to use. Liquid fuels are ideal. If wood could be converted to a liquid there would be no possibility of fuel exhaustion. Some methods in this direction are known, but they are costly and only a fraction of the wood is converted into a liquid. Other more fanciful methods have been suggested. Camille Flammarion, the French astronomer, proposed using the internal heat of the earth. Boilers could be placed in deep shafts and an unending source of heat exploited. Keeley invented an engine that ran by synchronized harmonic vibration of the ether. Striking a note on a violin let loose a power that could make Niagara flow backwards. Certain members of Congress easily understood the principle of Garabed. Ultra-violet light will decompose water to some extent. The recombination of their elements evolves more heat than in any other reaction. Think of the energy of the moving sap in the trees. The pine forests along the Southern Pacific's right of way should easily propel the trains to the summits of the Sierras and, of course, there would be no difficulty after that; it would all be downhill. Think of the energy in a million tons of radium. It is really easier than hunting lions in the Desert of Sahara.

But there are lions in the Sahara, although sifting the desert may not be the ideal way of capturing them. So some of these fanciful ideas may be the germ of a method that will conserve fuel. Galvani's experiments with frogs' legs and Benjamin Franklin's observation of the sparks scintillating from the key tied to the string of a kite flying during a thunderstorm were of not much significance at the time, but think how much fuel has been conserved as a result of their observations!

The Chemist's Part in the Conservation of Fuel

But to come more directly to my subject: what part does the chemist play in the conservation of fuel? In the first place he devises a system of measurements. Science aims to be exact. The weight of the earth, the distance to the moon, the temperature of the sun, the size of an electron are problems that have been solved. The human mind thinks quantitatively and it is the business of the scientist to formulate the units. The same applies to heat measurements. All combustible substances have not the same calorific value. Wood, coal, oil, gas, peat are used for fuel. One way to determine their relative heat value is to burn them under the boiler. A better way is to make quantitative determinations on small samples. The coal may be analyzed, and its component hydrogen and carbon determined. Knowing the heat values of hydrogen and carbon, the calorific value of the coal may be calculated. A still better method is by use of a calorimeter. There are several forms of this instrument. The most elegant, simple and accurate method was, as usual, devised by a Frenchman. The Berthelot bomb is a device whereby a weighed amount of the combustible substance is burned in compressed oxygen and the heat value determined. The most practical forms of the Berthelot bomb are made by Americans, which is also usual.

By means of a calorimeter we can determine the relative heat value of the combustible. The coal operator can obtain a proper price for his fuel, the coal consumer can be sure that he is purchasing the cheapest kind, for the lowest dollar value per ton does not always means it is the cheapest coal. Coal is not a permanent substance. Exposed to the air it oxidizes or weathers. It slowly burns up. There is a selective oxidation. The hydrogen and carbon of the coal are not oxidized in the same ratio. The heat value of hydrogen is greater than that of carbon, and if more hydrogen than carbon is lost, as is usually the case, the heat value diminishes. In other words, the loss in calorific value of weathered coal may be far greater than the loss in weight. Again, the chemist can determine the amount of this change and express it in quantitative terms.

Varying Values of Oils

The same methods may be employed in the case of oil. All oils do not have the same calorific value, as in the case of coal. The oil may be analyzed, the percentage of hydrogen and carbon determined and the heat value calculated, or the calorific value may be determined directly in a calorimeter.

Another element to be taken into account is water. All fuels contain more or less water. In oils it may amount to 30 per cent or more. Not only does this water lower the heating value, for water has no combustible value, but there is an additional loss for the reason that this water is converted into steam and the steam escapes through the stack without doing useful work. Anhydrous fuels are desirable. Many ingenious methods have been devised to dehydrate oils. The more efficient they are the more they aid in conserving fuels.

Sulphur in fuels is detrimental. While it possesses some heat value, it is much less than hydrogen or carbon, and it possesses the further disadvantage that in burning it is converted into sulphurous and sulphuric acid, which under certain conditions corrodes metal and disintegrates brickwork.

The chemist may determine all these points, but he may be of service in another direction.

Theoretical Value Never Realized

The theoretical heating value of fuel is never realized. There is always waste. The combustion may not be complete. There is an escape of hot gases and unconsumed decomposed fuel through the stack. There is heat lost but by radiation. Some of these losses are self-evident. When black smoke pours from a chimney one does not need a chemist to tell him that some of this fuel is wasted. But other losses are more insidious. Carbon burning to carbon monoxide evolves 21,000 units of heat, to carbon dioxide 68,000 units, an increase of over 300 per cent. As far as the eye can perceive one combustion is as complete as the other. Here again the chemist may aid. With his ingenious gas analysis apparatus and his heat-measuring devices the invisible is made visible, the facts are ascertained, and greater efficiency and economy attained, with consequent saving of fuel.

Radiation losses are considerable. Here again the chemist is of use. By direct and indirect methods he can determine relative conductivities of different materials, their heat, insulating qualities, and advise as to the efficiency of their use.

Distillation processes are large consumers of fuel. In this State we have large-scale examples in the oil refineries. Theoretically, distillation could be conducted with little consumption of fuel. The same amount of heat necessary to convert a liquid into a vapor is set free when the vapor is condensed to a liquid. By a proper system of heat interchanges the losses could be reduced to a negligible amount. Multiple evaporators are examples of devices to economize in fuel and they are reaching a high degree of efficiency.

By properly designed apparatus it might be possible to distill water from the bay or ocean for municipal or factory purposes at a less cost than bringing it from distant sources.

The same principle might be applied to furnace gases. The heat escaping from the stack or radiated might be used to warm the air supplied to the firebox by similar methods as used in Siemen's regenerative furnaces or other form of heat interchanges.

Supplying Oxygen Pure

One other method, if it could be worked out, would greatly conserve fuel. Practically all our heat processes depend on oxygen, and the oxygen is supplied from the air. You are all aware that the atmosphere contains only one-fifth oxygen. The other four-fifths are inert gases, as far as combustion is concerned. If we could obtain the oxygen in a pure or more concentrated form the economy of operation of all kinds of furnaces would be enormously increased, the difficulties of conserving fuels would be considerably diminished, and the problems confronting the engineer and chemist would be greatly simplified. Some efforts in this direction have already been made, but the task has not yet been accomplished.

In the short time at my disposal I trust that I have shown that the chemist has done his share in solving these problems and that he will be of even more use in the future.

Sees Vast Market for Benzol for Transportation Purposes After War

Norman S. Cox Discusses Possibilities of Future for Gas Companies from British Standpoint

There will be an enormous demand for benzol after the war, in connection with transport both by land and sea and in the air; and it might be found a paying proposition to continue its manufacture, if the naphthalene troubles arising out of its recovery can be overcome, in the opinion of Norman S. Cox, as expressed in a paper before the North of England Gas Managers Association recently. The co-operative arrangement between tar producers and distillers (which have almost reached the stage of agreement) should have a beneficial effect. Large quantities of dehydrated tar will be required for reconstructing roads after the war, and this, together with the laudable endeavor to make the country self-supporting respecting dyes, should stimulate the demand, with a subsequent improvement in the price, which has been at such a low ebb for so many years.

Sulphate Consumption Not Up to Demand

Notwithstanding the large amount of propaganda work carried out by the Sulphate Ammonia Association, and by many undertakings in their own districts, the home consumption of sulphate was only a small percentage of the output. But the conditions of war have changed this, and now farmers, who were not easily convinced as a rule, are generally satisfied as to the enormous advantages to be obtained by treating their land scientifically.

The results so far obtained by the utilization for public purposes of surplus coke furnace gas have been eminently satisfactory; and where available in large quantities, it should enable gaseous fuel to be sold at a price that would brook no competition.

The sole object of the Household Fuel and Lighting Order, which entailed an enormous amount of work and serious financial loss to the gas industry, was the saving of coal, the necessity for which was no doubt great. The industry, however, will use every endeavor faithfully to carry out its share of the burden. The Order was presumably intended to encourage the use of gas, which was undoubtedly the best method of obtaining the desired result, and at the same time assist in relieving the transport difficulties. The gas equivalent per ton of coal has been fixed too low to attain this end, and should be substantially increased—especially in bleak districts, where the hours of daylight are less than in other parts of the country, and where baking and washing were usually done at home.

Importance of the Showroom—and of Guarantees

Speaking of the distribution department, Mr. Cox said the relationship between the showroom, development and fitting departments should be the closest co-

operation. In the apparatus supplied, simplicity and standardization, coupled with efficiency, are of the utmost importance. Central offices and showrooms adjoining, if possible, should, of necessity, be imposing, and in a prominent position in the principal street, and should be kept up-to-date in every way, and not allowed to get an uncared-for appearance after the novelty has worn off. Consumers should have the opportunity of seeing the various apparatus tested, and claims should not in any case be made which could not be substantiated in actual practice. This has, unfortunately, been done occasionally by makers; and when the consumption proved to be in excess of the claim, the consumer was dissatisfied. It is much better to slightly overstate the consumption, as the margin in favor of coal gas is sufficiently large to allow of this in most instances. When the results prove better than the guarantee, all concerned are satisfied. The subject of gas sales is not of great importance under existing regulations; but there is still a large field for extension in this direction, and preparations, wherever possible, should be made in advance, to enable the full advantage to be taken immediately the restrictions are removed.

Proper ventilation of all buildings is of vital importance, whether in factory or home, as efficiency could only be obtained if it be under hygienic conditions. Gas has played an important part in this direction, and should do much more in the future. Where new buildings are to be erected, it should be part of the undertaking's policy to co-operate with the architects to obtain adequate ventilation, and also to keep them posted with regard to the many advantages of gas.

Gas Used for Indusjrial and Powfr Purposes

In 1913 the Sunderland Gas Company established a demonstration room, where the latest types of furnaces are to be seen by appointment in actual operation at suitable times, when influential men likely to be interested were invited to be present. As a result of this, combined with energetic canvassing, upwards of a hundred furnaces had been fitted during the last few years for numerous and varied purposes, and special apparatus designed for the preliminary heating of an electric steel melting furnace to reduce the fuel cost per ton of steel. As showing the progress made in this direction, the following figures are given:

1913, 195,000,000 cu. ft. per annum (principally engines); 1914, 215,000,000 cu. ft. per annum: 1915, 230,000,000 cu. ft. per annum; 1916, 235,000,000 cu. ft. per annum; 1917, 270,000,000 cu. ft. per annum.

The table shows an increase in the gas used under this head of 38 per cent, due entirely to the introduction of furnaces.

One local firm, who originally conducted all their heating operations by coal and coke, now use gas exclusively for annealing and hardening. About 120 tons of steel are turned into files per annum; and the gas consumption for this and other purposes is 1,181,000 cu. ft. A more striking illustration is a local glassworks, whose gas consumption before furnaces were adopted for annealing and fire-polishing was 3,000,000 cu. ft. per annum, whereas now it amounts to nearly 50,000,000 cu. ft. Better working conditions prevailed; far superior results were obtained; and the breakage in annealing was reduced from 10 to 2 per cent.

A Fair Prospect

The prosperity of a gas undertaking depends very largely on the methods adopted to retain consumers, to obtain new ones, and to encourage the use of additional and up-to-date apparatus. Collectors and inspectors are in constant touch with the public, and can assist very materially by entering daily in a report-book all cases where there is any sign of dissatisfaction, or where there is a likelihood of obtaining an order for new appliances. This book forms the basis for the work of a staff of carefully selected canvassers, who must be well trained and thoroughly conversant with all matters concerning the economical use of gas. The old saying that dividends are made or lost in the retort house is only half the truth, as, while they may be made there, they can easily be lost in the other departments, and it might be said that the consumer is gained or lost at the burner.

Extensive After-War Construction

The many necessary extensive alterations and repairs held in abeyance to be carried out after the war will mean an enormous expenditure; and undertakings which have been able to do so have wisely put aside sums to meet repairs which would have to be attended to as soon as possible. The raising of capital will be a difficult problem, and stock will in most instances have to be sold below par. The inflated wages being paid will not return to their pre-war level, with the result that all materials will cost more, unless the output per head is considerably increased—there is plenty of room for improvement in this direction, as the country was a very long way behind. The general adoption of machinery wherever possible will have to be resorted to, or our chances of holding the premier place as an industrial and commercial nation will indeed be small. Mr. Cox expressed himself as being a great optimist regarding the future supremacy of the country, but it would need forceful energy and concentration in all directions, and friendly and loyal co-operation between employers and employed, to enable it to retain its position against strenuous and powerful opposition. When the necessity for purchasing war savings certificates ceases it is very desirable to be ready with an approved scheme of investment in some safe security to encourage the employees to continue without a break their weekly contributions.

Enormous scope of business is available to the industry if only it realizes and is prepared to grasp to the fullest extent its possibilities. The lines of future development are clearly indicated, and the prospect most alluring, with the expansion of the industrial business and the great possibilities in hot-water supply and room-heating with a gas not necessarily of high calorific power, but one containing a low percentage of incombustibles, thus giving a good flame temperature.

Mapping Naphthalene Stoppages

At Sunderland they had always been troubled with naphthalene; but immediately on starting oil-washing for the extraction of benzol, toluol, etc., the number of complaints of stopped services jumped up to an alarming extent, so much so that after a fortnight's working the plant had to be shut down. It was re-started

a few days later, under altered conditions, and the results showed some improvement. But they have suffered considerably ever since, and the additional cost over previous years had been a serious item. A still more serious point is the annoyance and inconvenience caused to consumers by the continued necessity for clearing their services, which made them dissatisfied with gas, and possibly caused them to consider the advisability of making a change. In some known cases they had actually made the change, which meant a permanent loss to the company, through no fault of its own. At one period of extreme changes in atmospheric conditions they in one day received upwards of 2,000 complaints; and with the shortage of labor it was quite impossible to cope with this number. Still, with the assistance in emergencies of the available officials (all of whom had been previously instructed in the art of clearing stoppages), in addition to all the fitters and laborers, they had so far been able to overcome the difficulties.

Absence of Naphthalene Complaints in Areas Supplied by Vertical Retorts

With the object of obtaining useful information, a map of the area of supply was divided off into squares and districts, and each week tracing paper divided into similar squares was placed over the map, and every day the naphthalene stoppages cleared were marked thereon by black dots for the ordinary consumers and red dots for the slot consumers. One expected but nevertheless marked feature was the absence of dots in the area supplied from the vertical retorts. Another was that the red dots represented a very small proportion of the total; the reason being that when they adopted prepayment meters they deemed it advisable to lay services in excess of the anticipated consumption. This map was inspected daily, and one could see at a glance if there was a prevalence of complaints in any one section or street, in which case they washed out the main or mains affected, and, if this was not efficacious, opened and cleared them. He had hoped to see the dots near the works gradually reduce in number, and then week by week the area clearing farther away, showing that the solvent used at the works was gradually not only overcoming the naphthalene in the gas, but also that in the mains, and that ultimately they might be freed to a considerable extent, if not altogether, from this source of trouble. Unfortunately, there was no sign, so far, of this ideal being realized.

Every endeavor should be exerted (which had certainly not always been the case in the past) to avoid reckless and extravagant expenditure of capital. On the other hand, no one would suggest working an obsolete and wasteful plant. There is, however, a happy medium. If an undertaking became over-capitalized, their difficulties in meeting the serious and stern competition in the future are much enhanced. The sliding scale had, no doubt, many advantages when wisely administered; if not, it was fraught with dangers—a tendency being to starve the works to enable a reduction to be made in the price of gas and automatically increase the dividend. The capital per million cubic feet of gas sold was a figure that should never be lost sight of.

Experiences with Gas for Traction

The use of gas as a power agent for traction purposes is steadily increasing, and when war conditions permitted of the manufacture and supply of compressing plant and cylinders, the use of gas propelled vehicles might be greatly extended. A 20 h.p. "Studebaker" van used in connection with the clearing of slot meters —one of the earliest cars fitted with a flexible container and holding 250 cu. ft. of gas—covered a distance of eleven miles (equivalent to approximately a gallon of petrol) and had given every satisfaction. Two coke delivery wagons also had been adapted. It was very necessary to have suitable appliances for keeping the bag in position when deflating; otherwise it flew out and might catch obstructions, which might be fraught with serious results.

They had a small experimental plant comprising a two-stage vertical compressor with piston displacement of 15 cu. ft. per minute, which will compress gas to 1,200 lb. per sq. in. when running at 400 revolutions per minute,, and a 7 in. diameter water separator. A 10 b.h.p. two-seater "Humber" has been running on coal gas compressed to 1,200 lb. The steel cylinder, 3 ft. 4 in. long by 8 in. outside diameter, with a capacity of 84 cu. ft., carried at the back, weighs 98 lb. The gas passes through 3/16 in. inside and 5/16 in. outside diameter copper tube to a reducing valve, pressure gage, and suction chamber, weighing 14 lb., where the gas is filtered, and the pressure reduced to a few tenths of an inch, and from there to a special carburettor. The car started easily, ran smoothly, and would cover eight miles on one charge. At present, however, a reduction in the power (particularly on the hills) is noticeable. As it was only used for supervision work in their own area of supply, and could be switched on to petrol if necessary at any time, the difficulties of filling stations did not apply. However, for the future it would be necessary to build specially adapted vehicles, and to standardize cylinders and connections to enable users to have them quickly charged at the appointed stations at any town or village on the main routes, or, better still, in the case of detachable cylinders, to change the empties for full ones.

Organization of the Industry

The various organizations intended to represent the industry have, no doubt, done excellent work during the war; but it seemed more than ever essential to have a national body, representative of every section of the industry, which could speak unitedly and authoritatively on its behalf on all subjects. There are signs that the necessity is at last being realized, and steps will be taken to make this an accomplished fact, and that the movement will meet with the whole-hearted support of every undertaking in the country. A new and more prosperous era is dawning. We have heard much about the centralization and amalgamation of electric undertakings. If the gas industry is to prosper, similar amalgamation might be necessary, perhaps not to the same extent, but for the large and suitably situated gas undertakings to extend their plant and also their area of supply to embrace smaller undertakings.

Publications

Low Rate Combustion in Fuel Beds of Hand-Fired Furnaces

Technical paper 139 of the U. S. Bureau of Mines. Paper backs; 9x6 in.; 52 pages; illustrated. Authors, Henry Kreisinger, C. E. Augustine and S. H. Katz. Obtainable from the U. S. Bureau of Mines, Van H. Manning, director, Washington, D. C.

This paper presents the results of a study of the processes of combustion in the fuel bed of hand-fired furnaces when burning coal at such low rates of combustion as are used in house-heating apparatus. The study is an extension of the work reported in Technical Paper 137*a*, which covers the higher rates of combustion, such as are used in burning coal under power plant and locomotive boilers. That report deals with rates of combustion of 20 to 180 lb. of coal per square foot of grate per hour, whereas this paper covers the rates below 20 lb. The same apparatus and largely the same methods were used as in making the experiments with high rates of combustion. Therefore only the most important features of these are described in this paper; for fuller details the reader is referred to the report mentioned.

Spectroradiometric Investigation of the Transmission of Various Substances

Scientific paper 325, U. S. Bureau of Standards. Flexible board backs; 7x10 in.; illustrated. Authors, W. W. Coblentz, W. B. Emerson and M. B. Long. Obtainable from the U. S. Bureau of Standards, S. W. Stratton, director, Washington, D. C.

During the past few years radiometer determinations were made of the spectral transmission of radiant energy through various substances. These data are published in the present paper.

A practical application of these data may be made in isolating narrow spectral bands of radiation without the use of a spectrometer. In this manner it may be possible to obtain the spectral-energy distribution of stars which are too weak in energy for measurement after dispersion by a prism. The data are useful in eliminating scattered light in spectrophotographic and spectroradiometric work. In this laboratory some of the substances described have been employed as screens for transmitting bands of spectral radiations in an investigation of the photoelectric sensitivity of various substances.

When it is possible to sacrifice spectral purity in order to obtain high intensity, some of these substances, which have bands of transmission which are 70 to 80 per cent at the maximum, may be more efficient than a spectrometer in producing stimuli of spectral radiation of high intensity and covering a large area.

The apparatus used for determining the transmissions in the visible (yellow to red) and infra-red parts of the spectrum consisted of a mirror spectrometer, a fluorite prism, and a vacuum bismuth-silver thermopile, described in previous papers.

Some of the data in the violet part of the spectrum (indicated by dotted lines in the illustrations) were taken from the papers published by Luckiesh and by Gage. The rest of the data in the blue and violet were obtained by means of a lens spectrometer, a glass or quartz prism, a potassium photoelectric cell (constructed by Dr. Kunz), and a high-resistance Thomson galvanometer.

The Manufacture of Sulphate of Ammonia

Second edition; cloth-bound volume; 9x6 in.; 153 pages; illustrated. Author, Gascoigne T. Calvert. Published by Benn Bros., Ltd., London. Obtainable from D. Van Nostrand Company. Price $3.00 net.

The contents include: Sulphate of ammonia; its composition and analysis; the raw materials; ammoniacal liquor, sulphuric acid and lime; plant required for the manufacture of sulphate of ammonia; general description — supply of ammoniacal liquor — tachometer — superheaters; Walker's, Colson's and Davis' stills; recent types of stills—Colson's, Wilton's, Walker's, combination, Wyld and Shephard's, Wyld's; liming apparatus; waste liquor valves, cooling arrangements, etc.; saturators of various types—hand-fished, ejector discharged, bottom valve discharged; drying, storing, packing, etc.; the waste gases—conversion into sulphuric acid—Claus process—oxide purification, etc.; starting, working and stopping the plant—difficulties in working and their remedies; cost of manufacture of sulphate of ammonia; manufacture of crude ammonia or concentrated ammoniacal liquor; manufacture of sulphate of ammonia in small works; miscellaneous; alkali, etc., works regulation act, 1906—factory acts (special regulation)—respirators—sulphuric acid—quantity of ammoniacal liquor required to make a ton of sulphate—analysis of waste liquor, etc., and design of a sulphate of ammonia house—comparisons of ammoniacal liquors—sulphuric acid table.

The Fusibility of Coal Ash and the Determination of the Softening Temperature

Bulletin 129, issued by the U. S. Bureau of Mines, Department of the Interior, Washington, D. C. Authors, A. C. Fieldner, Albert E. Hall and A. L. Field.

In describing the purposes and scope of the investigation the authors say:

"As a safeguard against excessive clinker troubles, specifications for the purchase of coal can be drawn to include the 'softening' or 'fusing' temperature of the ash. The value of such information has been recognized by the Bureau of Mines and has induced the bureau to investigate laboratory methods of determining the fusibility of coal ash and the bearing of the results on clinker formation in fuel beds. The bureau realized that the fusibility of a mixture of oxides and silicates such as is comprised in coal ash varies according to the conditions under which tests are made, and that in the absence of any generally accepted method no agreement is to be expected among tests made in different laboratories. Indeed, L. S. Marks has recently called attention to differences as great as 390 deg. Cent. that were obtained with the same sample of ash by two different laboratories. Therefore, if a fusion-temperature clause is to have any place in specifications for coal, a standard method of testing should be adopted in order to insure comparable results by different laboratories and to obtain the softening or fusing temperature of the ash under conditions similar to those of a fuel

bed. After a consistent method has been devised for obtaining comparable results at different laboratories, there will remain the correlation of these results with those from the burning of coal in furnaces before the value of fusibility tests in coal specifications can finally be determined.

"The present publication reviews the literature on the subject and gives in detail the effect of various oxidizing, reducing and neutral atmospheres such as are found in various parts of the fuel bed on the softening temperature of ash when molded in the form of Seger cones. As a result of this study a practical method of determining fusibility has been developed whereby the ash is caused to soften and form slags in which the iron exists in approximately the same state of oxidation as the iron in fuel-bed clinkers.

"Although it is believed that this method will indicate the probable clinkering characteristics of a coal better than any fusion tests heretofore described, the bureau does not recommend the general use of this method in coal specifications until it is justified by actual trial in furnace tests of different coals. As no fusibility test of a well-mixed sample of the average ash of a coal takes into account the physical distribution of the impurities in the coal as burned, much additional investigation is needed to establish the exact relation of these laboratory fusibility tests to clinker formation. In order to correlate this proposed test of minimum softening temperature with clinker formation, the bureau is now making clinkering tests in a specially designed experimental furnace, in which different coals having ashes that differ in fusibility are burned under similar and known conditions of combustion. The results of this investigation will be published in a subsequent report. In the meantime it is hoped that other investigators will obtain similar correlation data."

How the Gas Companies Are Helping the Nation

CORNELIUS SCANNELL, was recently seriously wounded in action in France, according to a telegram received by his parents from the War Department. Mr. Scannell before enlisting in the old Fifth Maryland Regiment was employed by the Consolidated Gas, Electric Light & Power Company, Baltimore, Md. Before going overseas with the Blue and Gray Division he was stationed at Camp McClellan, Anniston, Ala.

PRIVATE FRANK T. SISCO, of 45 Wayne Avenue, Paterson, N. J., has been wounded for the third time, his name appearing in a recent casualty list, official from the War Department at Washington, as being slightly wounded. He is a member of the 165th Division and is twenty-one years of age. He was wounded first on March 21, gassed during the first part of June, and upon his recovery sent back at once to the front lines, where on Aug. 1 he was again wounded. Private Sisco enlisted with the 69th Regiment in September, 1917, and after a short, intensive training of six weeks was sent over to France, where he has been a year. Before enlisting he was employed by the Consolidated Gas Company of New York.

WALTER JENNINGS, president of the National Fuel Gas Company and a director of the Standard Oil Company of New Jersey, has been elected chairman of the New York County Chapter of the American Red Cross, according to an announcement by the executive committee of the chapter. Mr. Jennings succeeds Robert W. Forest. Mr. Jennings has relinquished his own business in order to be able to devote himself wholly to the management of the chapter.

THE OHIO CITIES COMPANY'S employees have subscribed liberally to the Fourth Liberty Loan. Out of 2,800 employees of the company over 2,000 have subscribed to Liberty Bonds. The company is carrying the necessary loans to make many of these subscriptions possible.

THE WESTERN GAS CONSTRUCTION COMPANY employees have made every effort to help carry Fort Wayne, Ind., over the top in the Fourth Liberty Loan drive. The figures of nearly $50,000 of the Fourth Bond issue distributed among the 400 men pay especially high tribute to their enthusiasm. Another 100 per cent response has been the result of this drive of the plant, notwithstanding their heavy burdens of the previous loans. The figures for the office total $18,850, or an average of $212 per employee, was pledged. The machine shop showed $13,000, or an average of $94 for every man employed, while the foundry total shows $10,200, or an average of $97 for every man. The tank shop has a total of $4,300, or an average of $80 per man, while the pattern shop came to the front, ahead of them all, with an average of $124 per each man, total $2,350.

THE UNITED NATURAL GAS COMPANY, Franklin, Pa., subscribed $35,000 to the Fourth Liberty Loan.

THE RESERVE GAS COMPANY employees who are camping on Cabin Creek, near Good Hope, D. C., while working on the construction of a pipe line which will take gas to Kennedy Station in Lewis County, got busy on the last day of the drive and subscribed $1,700 to the Fourth Liberty Loan, in addition to $2,000 which they had subscribed earlier in the campaign. The subscriptions received Oct. 19 make the workers over the top almost 200 per cent. W. S. Dunham, general foreman at Kennedy Station, made a tour of the line for the purpose of soliciting eighteen Hope Natural Gas Company employees who had been transferred there from the station at Hastings. They bought $650 worth of bonds, and then the "old crowd," which had already gone over the top, bought $1,700 worth, making a total of $2,350 for the day's work.

THE NORTH ATTLEBORO GAS LIGHT COMPANY, of North Attleboro, Mass., has bought $15,000 worth of Liberty Loan Bonds and has given gas and fixtures to the Red Cross whenever occasion arose. Fully 85 per cent of the employees bought bonds during the Fourth Liberty Loan drive.

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Lining Up the Commercial Department

To-day, in general, it is a simple matter to sell all the gas we can make. But we are held back by necessary governmental restrictions from selling.

But when the war ends there will of necessity be a falling off in the demand. Unless all signs fail there will still be an ample market for all the gas we can make; but it is possible, unless we are forehanded, that our plants may be working on part load when an instant market is right at our doors demanding service.

The present is none too early to line up the commercial department and to lay plans for a new business to replace every business we lose.

Where will we center our efforts? Will it be on lighting? heating? industrial fuel? In justice to ourselves we cannot center on any one of them. Nor can we afford to neglect any one of them.

The public has been educated away from the open-flame burner, and, where it isn't, it is receiving very unsatisfactory service. We must capitalize this opportunity which, if we do not do promptly, may have a boomerang effect. And, what is more serious, we are fighting against time. We cannot afford to sell gas lighting in our old leisurely manner. We must go after it harder and more ambitiously than we ever did. Otherwise the business will be taken away from us by electricity.

For a longer period than we can foresee house-heating by gas doubtless will be more expensive than by coal on a fuel-cost basis exclusively. Compensating advantages and economies, such as freedom from attendance, ashes, etc., are known and have been known to gas men for years. Within the last fifteen months there has been added a predominant advantage—certainty of supply. This advantage may but be a hazy memory in the way of actual demonstration a few years from now, though it will always be a real advantage of considerable value. But we cannot sell to the public on surmises and suppositions. We must sell on the basis of demonstrated facts of which the people themselves have a knowledge. If the business of house-heating by gas were a generally established business there would be no timely advantage in pressing this end immediately. But it is not. Systems actually installed will be our clincher in the sales yet to be made. If we are to have them in sufficient numbers and sufficiently widespread the time to go after them is the immediate future, when certainty of supply is a really impelling argument.

We have two important branches of the business, then, that require immediate attention, each on a scale that would have taxed the full energies of our commercial organizations on a pre-war basis. We still have to consider industrial fuel.

Can we afford to let it take care of itself for the time being? Undoubtedly we can if we are to be content with having it merely come in in volumes comparable to pre-war standards. But can we afford this? Assuredly we cannot unless each foot of this business, when we really want to get it, is to cost us ten times and more what it rightfully should.

Industry to-day is thoroughly "sold" on gas as a fuel. There are hundreds of manufacturers and industries that are not using it now simply because they could not get it. We can write just as much of this business in the immediate future as we have a mind to. And, as in house-heating, the best selling argument we can have in this line is a near-by successful installation doing similar work. Therefore, the greater the number of these installations doing the greatest variety of work the simpler will be our task later on in establishing gas as the fuel of the industries.

The after-war commercial department must of necessity be a much more ambitious and important adjunct to the business than it was before. If the gas industry is not prepared to make it thus, then indeed it is "a sleeping industry."

Finding Something to Worry About

There are some people in this great world who simply *must* worry. If nothing obvious appears to agitate their minds there is no limit to the extent they will wander afield to find something.

Many have gone from the gas field into the military service. A large number of companies have obligated themselves to find a place for these men when they come back.

The large majority are, of course, men who up to the time of leaving the companies had not found themselves and were occupying subordinate positions.

Since entering the military service there has come evidence that large numbers have developed rapidly, at least, in the military calling. He who left us as Private Smith has become Lieutenant Smith or Captain Smith, and even perhaps Major Smith.

When this group comes back what are we to offer them? Their old jobs! If so, will they be content to accept them, after exhilarating months of giving orders to reduce themselves again to subordinate roles?

In our opinion these questions are about as important as the tar we buried a hundred years ago to be rid of.

If the erstwhile Private Smith, who was a clerk in the collection department when he left us, has become Captain Smith, it is evident either that he has since found himself or someone else has discovered in him qualities that we failed to detect. They do not promote privates in the United States Army to the commissioned ranks merely because they patriotically volunteered for the war. Consequently, there is a place in our organization much more important than the place he formerly occupied for Captain Smith to step into when he comes back, and the likelihood is that he will fill it ably enough.

It isn't fundamental knowledge always that counts most in success in life. It is the quality of leadership. We have seen men successfully at the head of highly technical departments who were inferior in technique to three-quarters of the workers under their direction. Yet it is questionable if the efficiency of the departments would have even been maintained, much less improved, if one of the apparently better equipped subordinates had been elevated to the executive post.

So we conclude, it is a matter of congratulation rather than a cause for worry that the erstwhile Private Smith has gotten up so that we cannot think of offering him the same job he left when he comes back. It is the big jobs the gas industry of the future will have trouble in filling rather than the little.

Driven Away, Though He Preferred to Stick

The AMERICAN GAS ENGINEERING JOURNAL has not been prone to view the human side of the question of compensation of technical workers in the gas industry. All its thoughts in this direction have been held spellbound in amazement at the stupidity of a system that grinds down to bare bone a loyal employee, yet returns no profits to the company itself.

Gas rates are based on operating costs plus a fair rate of return and conservation of investment. By paying a worker on a scale much below workers on a similar plane in other fields are paid operating costs are, it is true, held down. But this is a saving to the consumer, not to the company; and the consumer is not even grateful, because never will he credit the gas company with holding down costs to him, even at the expense and deprivation of its own family.

But we were reminded the other day of the human side. We had a visitor. He had been many years a worker in the gas industry, and, despite almost desperate efforts on his own part to remain such, he had been driven out.

This man has a family—a wife and three children. We did not think to inquire what right a worker—a real worker in the public service—had to indulge himself in such luxury.

He had been struggling along for years on the amazing salary a small-town company endows its superintendent with—holding on.

Higher and higher went living costs. The children grew older and cost more to keep decently and to nourish. The salary remained stationary. Still

he held on. He loved the business and was loyal—mistakenly loyal, some might consider—to his company.

But the deluge came with the war. He was engulfed in the high costs of living. Still he continued to hold on, but the tension was almost unendurable. He went into debt, and was daily, almost hourly, beset by creditors. Then he let loose. He had to.

He accepted a position elsewhere—one that had been open to him some years back. The compensation is not large, but it is double what he had been getting. He is not yet out of the woods financially, however. He is paying up those debts; still paying tribute to public service.

His mission to our office furnished an index to his character. He was still loyal—wanted to know if we knew anyone we could recommend for his former job; one who would accept the same salary his company was paying its superintendent ten years ago. We are afraid we didn't give him much comfort: had to tell them that breed of jackass became extinct some time ago.

Britain Sacrificed Her Coal to Win the War, We Must Do the Same

Do you remember when General Gough's army gave way and Field Marshal Haig sent out the message "We have our backs to the wall"? That happened last March, but the way the situation was saved has only just been revealed to the British.

Seventy-five thousand coal miners were taken from their work in England and sent to defend the colors. Like Horatius and his companions, these miners held the line until our marines could get in their good work, and we all know what they did.

Saving the armies in France by using these miners has meant a shortage of coal in England. The total shortage at the present time is estimated at thirty-six million tons.

The action of the supreme commander in taking these miners at that critical time has been splendidly justified, and it is up to the civilians who will be short of coal this winter to take their share of the discomforts of war. They have been asked to have false bottoms put in their fire grates and diminish the size of large ones by means of fire bricks; not to start any fire until real cold weather sets in; never to replenish a fire late at night; rake it out and save the cinders when leaving it for the night; cook fewer hot meals; take fewer hot baths; never light a coal fire when gas will do.

British coal has been responsible for much of the success we have had in transporting our men and munitions. Millions of tons of it will be wanted by our army in France; our own coal is too far away. French coal fields are in the enemies' hands, and Britain will have to supply France, Flanders and Italy.

With this object lesson before us it should not be hard for us to understand the requests and co-operate with the Fuel Administration in this country. We are famously well off compared to our allies, but it is absolutely necessary that everyone should and must do his utmost to conserve coal. The war program of the nation demands eighty million more tons of coal this year than last, according to figures compiled by the Committee on Public Information. Some of the needs are as follows:

We are calling for eight million tons of steel ships, and to manufacture and deliver the steel for them will take fourteen million tons of coal.

Three million tons are needed to carry our average monthly delivery of troops to Europe, and four million tons to transport their supplies.

One hour of intensive artillery action at the front uses up 1,800 tons of steel, which it takes 7,200 tons of coal to produce.

To manufacture and transport the 60,000,000 shells that were fired by the French in the battle of Verdun called for the consumption of nearly nine million tons of coal.

The demands for coal this year have increased in American industrial plants 18 per cent, in gas and electric utilities 15 per cent, in shipping 30 per cent, in the railroads 7 per cent and in domestic consumption 13 per cent.

It has been impossible to provide for these increases by increased production. There have been 224 new mines opened and weekly production has risen as high as a 17 per cent increase over the corresponding week of 1917, but there has not been the necessary mine labor available to meet the whole demand and there have not been coal cars enough to keep the coal moving from the mines.

Obviously, then, the only thing to do—that can be done—is to SAVE coal.—*Advance Club News*

Saving Coal in Boiler Plants

Technical paper 205 of the U. S. Bureau of Mines, Van H. Manning, director. Paper backs; 9x6 in.; 24 pages; illustrated. Author, Henry Kreisinger. Published by and obtainable from the U. S. Bureau of Mines, Washington, D. C.

This paper, published by the Bureau of Mines in the interest of more efficient utilization of fuels in this country, gives suggestions as to what can be done in the boiler room to save coal. It covers the field between two other Bureau of Mines publications, Technical Paper 80, "Hand-Firing Soft Coal Under Power-Plant Boilers," and Bulletin 97, "Sampling and Analysis of Flue Gases." It is written for the fireman, the engineer, and the owner of the small or medium size plant, which is, as a rule, hand-fired.

The large plants usually have efficient and modern equipment, are mechanically fired, and are operated under the direction of technically trained and experienced men who hardly need such general suggestions as are given in a paper of this character. The small and the medium size plants, of which there are a very large number, have less efficient equipment, and, in addition, their size makes it inadvisable to retain a highly trained boiler-room operator. For these reasons fuel losses are likely to be higher in the smaller plants, and there such suggestions as are made in this paper will prove of greatest benefit. In these plants the hope of decreasing the losses lies entirely in the fireman, the engineer, and the owner or manager. These three men must closely cooperate if the desired results are to be obtained. The fireman and the engineer should give goodwill and steady endeavor; the owner or manager of the plant should encourage the fireman and the engineer to save coal, and should show appreciation of their efforts.

Decatur Company Sending Out Appeal for Nut Shells and Fruit Pits with Monthly Bills

Co-operating with the Government in the campaign to secure nut shells and fruit pits, the Decatur, (Ill.) Railway & Light Company is having printed a six-page pamphlet appeal for this material, from which carbon which makes the best gas masks are made.

Five thousand of these pamphlets will go out next month with the gas and electric bills into the large majority of Decatur homes. The concern is contributing the pamphlets voluntarily as its part in the movement.

Contract Giving Louisville Company Privilege of Procuring Gas from Newly Discovered Fields to Be Signed

Mayor Smith was empowered by the general council at its meeting recently to enter into a contract on behalf of the city of Louisville, Ky., with the Louisville Gas & Electric Company, which will give the corporation the privilege of procuring natural gas under its charter from newly-discovered fields between the forks of Beaver Creek in Eastern Kentucky, and transport the product there with the flow of gas from West Virginia.

Under the present arrangement between the gas company and the city the former is required to furnish its patrons exclusively with West Virginia gas. The contract to be signed now is simply a modification of the arrangement.

The ordinance states that owing to the fact that the gas company can not get a sufficient supply of natural gas from West Virginia sources to supply 12,000,000 cu. ft. of gas daily to that city it becomes necessary that gas should be obtained elsewhere and this can be done through a contract modifying the charter. The ordinance will probably be passed by the Board of Aldermen at the next meeting of the General Council.

Girl Meter Readers Employed by Allentown Company

The Allentown (Pa.) Bethlehem Gas Company have begun to employ women meter readers and it is believed that before long the entire meter reading force will be made up of women. About four months ago the first woman reader was employed.

Men will be continued for the present on quarter meters as their daily collections make a rather heavy load and it is not thought wise to subject women to this sort of work.

Even the clerical force has felt the influx of women into the business. Out of a force of 35 that were all young men one time, only four remain. The rest are women.

Proposition to Light Louisville Streets with Gas Submitted

An informal proposition to light the city of Louisville, Ky., by improved methods of gas lighting instead of electricity, as at present, under a contract with the Louisville Gas & Electric Company, was made to the Board of Public Works by S. M. Tittle, a representative of the Welsbach Street Lighting Company, of Philadelphia, at a conference. In view of the fact that both domestic and industrial users of gas at the present time are much concerned in securing an adequate supply of gas for the winter, it is not very likely that anything will be done with the proposition of the Philadelphia concern during the next few months. However, members of the board requested Mr. Tittle to submit in writing the ideas, which, he said, would give the city much better lights and at the same time save it 50 per cent in cost.

Louisville now spends about $200,000 annually for street lighting. There have been many complaints as to the lighting power of some of the street lights, according to members of the board, which is anxious to bring about an improvement in the situation. Mr. Tittle said that almost all the larger cities are substituting gas for electricity, especially in the outlying districts. He explained that the improvement in the burners makes it possible to furnish much better and cheaper illumination by gas than by electricity. He said that New York has 40,000 gas lights and Philadelphia even more. Indianapolis and Cincinnati, he declared, are increasing their gas lights at the present time, and other cities are following suit. Mr. Tittle also said that even with the price of artificial gas, street illumination by gas can be furnished better and cheaper than by electricity.

Milwaukee Company Denies Charge That Tar Products Wastes Taint Water Supply – Blames Hospitals

Sole responsibility for the pollution of the Milwaukee water supply by tar products wastes is denied by officials of the Milwaukee Coke & Gas Company, who allege that the objectionable taste may be due to other causes, that the decision of the city authorities was made on insufficient data, and that tests made by the company's chemists showed that refuse from the plant did not cause the taste complained of.

Ferdinand A. Schlesinger, head of the company, declared at a conference that the gas company is ready to do whatever is necessary to prevent pollution of the Milwaukee water supply regardless of cost.

For the last three months Milwaukee has been stirred by the objectionable taste of the lake water. So great has the complaint been that a triple investigation by the State health department, the city health de-

partment working in co-operation with the city chemist and engineer, and the Milwaukee Association of Commerce has been started. The investigators promise a solution shortly. The city water and health departments have reported that the bad taste in the water is caused by a combination of coal-tar products wastes with chlorine.

E. J. Tully, State sanitary engineer, and G. D. Hoyt, deputy State health officer, have confirmed this report, following a conference with H. P. Bohmann, superintendent of the Milwaukee water department.

The State health officer agreed that coal-tar waste matter from industrial plants is entering city water. He bases his decision on experiments made in Milwaukee and in the suburb of South Milwaukee, where similar conditions prevail. Both Mr. Tully and Mr. Hoyt will return to Milwaukee shortly to conduct further investigation.

Relative to a plea entered by the gas plant blamed for the contamination that the city's hospitals were to blame, Superintendent Bohmann made an absolute denial. He declared samples of sewage from Trinity, Mount Sinai and St. Mary's hospitals had been analyzed at several outlets, but no trace of matter that would give water a bad taste was found.

Petition for Higher Rate Filed by Montgomery Company

A petition for increased gas rates in the city of Montgomery and suburbs has been filed with the Alabama Public Service Commission by the Montgomery Light & Water Power Company.

Accompanying petition is a copy of a resolution adopted by the directors of the company on Oct. 16, taking cognizance of the losses sustained due to the supply of gas to the public on account of extraordinary increases in the cost of all labor and material.

"The extent of these losses is sufficient to financially embarrass the company to the point that service may be materially impaired," the resolution recites, and in conclusion, directs S. B. Irelan, vice president and general manager, to take immediate steps for securing relief from the public service commission.

The company, as shown by the petition, desires to establish a domestic rate of $1.50 per 1,000 cu. ft. of gas consumed through one meter per month. It is desired to establish the following scale of rates per 1,000 cu. ft. for industrial consumption per month, first 10,000 cu. ft., $1.50; next 10,000 cu. ft. $1.10; next 20,000 cu. ft. $1; next 20,000 cu. ft. 90 cents; next 20,000 cu. ft., 80 cents next 20,000 cu. ft., 70 cents; all over 100,000 cu. ft., 65 cents.

The company also asks to establish a minimum bill of 50 cents per month per meter installed.

The foregoing rates sought are for Montgomery, Cloverdale and Capitol Heights.

The present domestic consumption rate in Montgomery is $1.08 per 1,000 cu. ft., while the scale of rates for industrial consumption per 1,000 for a month follow: first 20,000 cu. ft. $1.08; next 20,000 ft. $1; next 20,000 ft., 90 cents; next 20,000 ft., 80 cents; next 20,000 ft., 70 cents; all consumption over 100,000 ft. 65 cents.

In Cloverdale only the domestic rate applies, which is $1.08, and in Capitol Heights there is only a domestic rate which is $1.35, but a discount of 25 cents per 1,000 ft. is allowed if the bill is paid within ten days. A one dollar per month minimum also is charged in Capitol Heights.

New Jersey Company's Application for Rate Increase Gets Hearing

The application of the Consolidated Gas Company of New Jersey for a further increase in gas and electric rates was recently heard before the utility board.

The company was granted an increase in the nature of a war surcharge last May and claims that the allowance was insufficient to meet the requirements of the company's operations.

Fred R. Cutcheon appeared as the company's witness and gave details as to the operations and revenues of the company during the current year and also applied to the commission to have its former determination modified.

The application was strongly resisted by William A. Stevens on behalf of Long Branch, Deal and West Long Branch; also by John S. Applegate for the boroughs of Red Bank and Fair Haven and Shrewsbury township.

The board's counsel raised legal objections to the method of procedure and the taking of further testimony was adjourned to a future day not yet fixed.

Protests Against Brockton Rate to Be Heard Nov. 20

The hearing to protest against the increase in the price of gas in Brockton, Mass., will be held Nov. 20, the hearing having been arranged with the State Gas & Electric Light Commission by City Solicitor, Wilbar, who is looking after the city's interests. The petition was presented many months ago, but since that time the price of gas has again been advanced.

Originally the petition was against the advance to $1.35 per 1,000 ft. but since then a jump of 20 cents has become effective. The petition bears the signature of Stewart B. McLeod as Mayor, having been presented during his administration in 1917. Ex-Mayor McLeod, however, will appear against the city as associate counsel for the Brockton Gas Light Company, of which he is now a director.

Alton D. Adams, a gas expert, who has been investigating the situation for many months, and whose report is ready, will appear as the expert for the city, and from preliminary reports of his work an excellent case has been prepared. The hearing will be held in the Council Chamber.

The new advance in the price of gas, which became operative during the summer, was the second in about a year. Formerly gas was sold at $1.35 per 1,000 ft. or $1.25 net. The new price is an advance of 20 cents to $1.55 gross and $1.45 net. The company, in announcing the latest increase, gave as reasons the enormous advance in the cost of materials and a recent wage increase to its employees.

Sacramento Company to Charge Higher Rates to Lodi Consumers

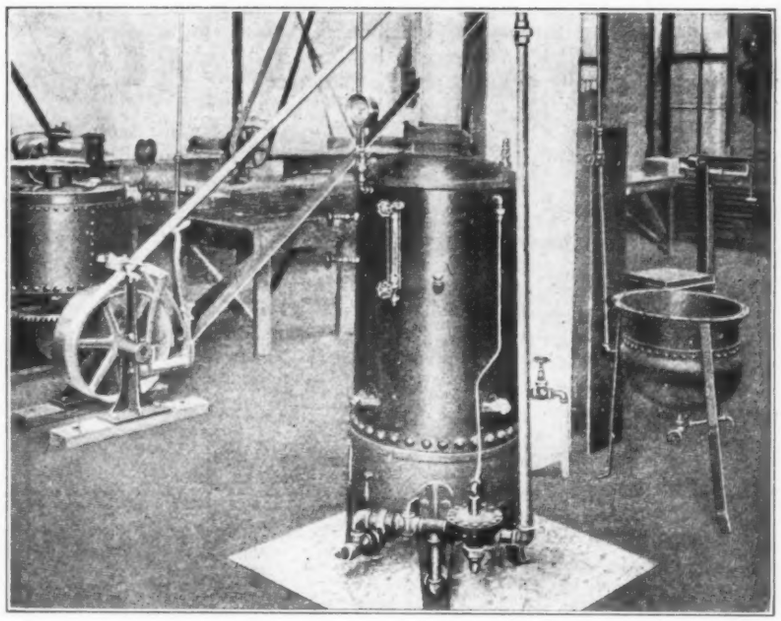
The Sacramento Gas Company has been authorized by the state railroad commission to increase gas rates at Lodi, Cal., and the following monthly schedule was fixed: First 500 cu. ft., $1; next 2,500 cu. ft., $1.90 per 1,000; next 7,000 cu. ft., $1.70; next 10,000 cu. ft, $1.55; all over 20,000 cu. ft., $1.45.

Gas Used by Chicago Manufacturer in Making Gum

Chewing-gum manufacturers use painstaking care that all the process and packing of their product shall be conducted in the cleanest, most sanitary and hygienic manner.

A chewing-gum manufacturer of Chicago uses gas-fired boilers, and finds them clean, quick and efficient. There is no tiny coal or particles of ash in the atmosphere as where coal-fired boilers are used.

The accompanying picture shows a 2½-hp. high-pressure boiler which furnishes steam for heating the jacketed kettles. This installation is in the factory of the Liberty Bond Confection Manufacturing Company, 113 South Jefferson Street, Chicago, which concern gets its gas supply from the Peoples Gas Light & Coke Company.



VIEW OF CHICAGO PLANT WHERE GUM IS MADE BY USE OF GAS

Committee Appointed to Investigate Natural Gas Supply Sources of Muncie Company

As an outgrowth of the failure of the natural gas formerly supplied by the General Indiana Gas Company to towns in central Indiana, dispatches from Muncie have just made public the fact that committees from several Indniana towns and cities, which are supplied with natural gas and artificial gas by the Central Indiana Company, have been appointed by John McPhee, city attorney of Muncie, acting as chairman of a temporary association of several municipalities, for the purpose of investigating the company's claims relative to the failure of the natural gas supply.

The committee will visit the West Virginia natural gas fields from which Indiana draws its natural gas supply. The action follows a petition of the Central Indiana Company before the public service commission of Indiana, for an increase in rates in twelve cities and towns.

The investigators are reported to have been informed by the report of a gas expert in Cincinnati and Louisville that the natural gas fields in West Virginia "scarcely have been scratched" and that there still remains plenty of the product for Indiana supplies. The cities and towns are reported to be ready to make a fight on the proposed artificial gas rate increases in case they confirm their hope that the natural gas supply in West Virginia is not exhausted as would appear from the general retrenchment of Indiana companies which have been using it.

The committees having the investigation in charge are made up as follows:

Investigation of the West Virginia Gas Field—Charles D. Parker, city attorney, Fairmount; Harry McAtee, councilman, Hartford City; R. H. Bunch, mayor; C. Ray Andrews, president board of works; B. F. Deardorff, city engineer; Harley Hartley and Harry Michaels, councilmen, Muncie.

Investigation of Artificial Gas Prices in Indiana—John D. Lewis, mayor, and Richard K. Broadbent, city attorney, Elwood; E. Hulley, mayor; Marshall Williams, city attorney, and James Brush, Chamber of Commerce, Marion; Mayor Malone, Alexandria, and City Attorney Neil, Noblesville.

Inventory, Appraisement and Audit— Charles D. Parker, Fairmount; George H. Koons, Jr., Riverside City; Omar G. Weir, Normal City; John F. Pyke, Tipton, and Phil O'Neil, Anderson.

Easthampton Rates Raised

Owing to increasing expenses the Easthampton (Mass.) Gas Company will raise the price of gas from $1.70 net per 1,000 to $1.90 net. The new price goes into effect Dec. 1.

One Year of War-Risk Insurance Compensation for Death or Disability, and Allowance for America's Fighting Forces and Their Families

One year ago to-day President Wilson approved the war-risk insurance act.

October 6, 1917, is a historic date in the annals of this nation and of the great world war, for it marks the beginning of altogether the wisest and most beneficent provision for the dependents of soldiers and sailors in time of war ever made by a nation in the history of the world.

Backing Up Our Fighting Forces

It was fitting to commemorate this significant anniversary that day, in the midst of the Fourth Liberty Loan campaign. A large share of the six billion fighting dollars we must mobilize to back up Pershing and his gallant men is going to pay family allowances, Government compensation benefits and Government insurance benefits to our heroic soldiers and sailors and those dependent upon them. Sustained by the assurances of the humane and generous provisions of the war-risk insurance act, America's manhood is enabled to go forth to battle stout of heart and with unwavering confidence.

The administration of the act by the Treasury Department through the Bureau of War Risk Insurance during the past year constitutes one of the big war tasks of the Government.

ALLOTMENTS AND ALLOWANCES

In the twelve months just ending the bureau has mailed more than six and one-half million checks in payment of allowances and allotments, representing a total disbursement of almost $200,000,000 for the care and maintenance of the families and dependents of our fighting men.

These wise and just provisions reach to every corner of the land. Approximately one million checks a month are now being mailed regularly to maintain this protection.

COMPENSATION FOR DEATH OR DISABILITY

The act also provides that liberal compensation benefits, without cost to the soldier, shall be paid for death or disability incurred in the line of duty, and in addition that every man wearing the uniform, who desires to provide additional protection for his loved ones, may take out not less than $1,000 nor more than $10,000 of Uncle Sam's insurance against death and total permanent disability.

UNCLE SAM'S INSURANCE

In the year past the bureau has written nearly thirty-five billion dollars of this insurance, or approximately as much ordinary life insurance as there was outstanding with all the life-insurance companies in the world at the beginning of the year. Our army and navy are more than 90 per cent insured and new applications are now being received for more than a billion dollars of this insurance per week.

The bureau has made awards and is paying monthly compensation on more than 5,000 death and disability claims, and it is paying monthly instalments of insurance on more than 9,000 insurance death claims.

THE ACHIEVEMENT OF ONE YEAR

In the performance of this threefold task the bureau has within the year handled nearly three million nine hundred thousand insurance applications and more than three million eight hundred thousand allotment and allowance forms, and it has been necessary to prepare and maintain under constant control more than twenty-six million separate individual card records. The bureau has received and answered more than three million letters.

From a small organization of twenty persons working in the basement of the Treasury Department one year ago, the bureau has grown until it now has a working force of 13,000 employees occupying thirteen buildings in Washington.

SAFEGUARDING THE SOLDIERS' KIN

The Treasury Department has left nothing undone to promote and improve the efficiency of the bureau in its vast work, and to reduce to a minimum the inevitable errors and delays incident to carrying out so large a mass of details. It is the aim of the Treasury Department to make the Bureau of War Risk Insurance the most efficient as it is the largest organization of its kind.

The work of the bureau during its first year represents the largest service ever rendered by any nation to the families and dependents of its fighting forces in time of war.

In view of the multitude and infinite variety of difficult details involved it represents probably the most stupendous task ever committed to a public or private organization to perform.

The Bureau of War Risk Insurance to-day is perhaps the largest business unit in the world.

W. G. MCADOO.

TREASURY DEPARTMENT,
Washington, D. C., Oct. 6, 1918.

Rate Increase Petition Filed by Northern Indiana Company

The Northern Indiana Gas Company, Hammond, Ind., filed a petition asking for a surcharge of 25 cents a 1,000 cu. ft. for gas at Frankfort and Lebanon and a surcharge of 15 cents at Crawfordsville. These towns now have a net rate of $1. The surcharge is asked for the period of the war, to become effective Nov. 1. The Indiana Gas Transportation Company of Lafayette, which carries gas to Bluffton, Decatur, Wabash, Logansport and Lebanon through mains from Fort Wayne, Peru and Frankfort, acting for the Northern Indiana Gas Company, asked for an increase in transportation rates from 2 cents a 1,000 cu. ft. to 5 cents.

Higher Rate Allowed Amarillo Company

The board of city commissioners recently took up the matter of the Amarillo (Tex.) Gas Company for an increase in the rates. The gas company was represented by Ed. R. Mayer, its manager, and J. B. Dooley, its attorney. After considerable debate, the application was granted, the new rates to be effective until six months after peace is declared.

The gas company sought consent to raise the rates for one year after the war was ended.

The matter of this application of the gas company has been before the city commission since last May, almost six months; therefore, Mr. Mayer contended that should peace be declared in a few weeks the company's permit would be at an end in a very short time and if it took six months to accomplish this from the commission it would be keeping a proposition before the commission for some time.

The new rates effective Nov. 1918 are as follows: $1.50 per 1,000 ft. for heating purposes; $1.75 for 1,000 ft. for lighting purposes. These rates are just the same as previously for 1,000 ft. consumers, but the minimum is changed from 50 cents to $1; the 10 per cent reduction on bills due and rendered before the 10th is eliminated. The charge of 10 per cent on over-due bills will still be in effect.

Commission Grants Surcharge of 35 Cents at Linton

The Public Service Commission, in an order handed down recently, granted a surcharge of 35 per cent on gas rates to the Linton Gas Company at Linton, Ind. The present net rate is $1 a 1,000 cu. ft. for the first 10,000 cu. ft. The minimum charge of 50 cents was increased to 75 cents.

Huron, S. D., Consumers to Pay Higher Rate for Gas

Consumers of gas in Huron, S. D., will have to pay $1.90 per 1,000 cu. ft. for gas, according to an announcement made recently by the Huron Light & Power Company. The new rate, which is an increase of several cents over the old, became effective Nov. 1.

Stockholders Vote to Dissolve Chattanooga Gas & Coal Products Company

Stockholders of the Chattanooga, (Tenn.) Gas & Coal Products Company, at a special meeting held recently voted to dissolve the corporation. Action was practically unanimous and there were no dissenting votes cast. About a year ago the assets of this company were taken over by the Chattanooga Coke & Gas Company and from that time on the Chattanooga Gas & Coal Products Company has not been doing any business.

The stock of the latter company is held by a few individuals and with the exception of about 200 shares which are held in Europe, all of the stockholders voted in favor of the proposition to dissolve the company.

HEALTH and COMFORT

SOLVED

The use of gas as an illuminant is far superior to any other known commodity, from a chemical standpoint the combustion of gas produces four different effects upon the air taken from the room, mixed with the gas in the burner and discharged back into the room.

CHEMICAL EFFECTS OF FLAMES ARE:

FIRST—THE amount of oxygen is reduced.
SECOND—THE amount of carbonic acid gas (CO_2) is increased.
THIRD—A very small amount of sulphurous gas (SO_2) is generally added.
FOURTH—ORGANIC impurities and deleterious substances are removed by incineration.

THE first, second and third effects are caused by the oxygen combining with the carbon and sulphur contained in the gas, and this oxidizing process generates heat in sufficient quantities to raise the mantle to the temperature of incandescence—about 1500 degrees F—which is sufficient to produce the fourth effect.

PHYSICAL EFFECTS ON THE AIR

FIRST—THE temperature is increased.
SECOND—The circulation of the air in the room is accelerated and the ventilation from the outside is increased.

HEALTH DEMANDS

THAT the HOME be kept warm, clean, cozy and cheerful and the temperature be even at all times.

WHY?

BECAUSE if the temperature cannot be controlled it means that your rooms are either too hot or too cold.

WITH too much heat there is waste of money, physical discomfort and danger to health, likewise there is equal danger in too little heat.

COLDS, backache and other minor and irritating ailments are to be had by having to run into your cellar to tend to the coal furnace, which must be cared for many times during the twenty-four (24) hours of the day to prevent it going out or becoming too low. If it happens that your coal fire is completely out it means about an hour spent in a cold damp cellar, submitting yourself to possible colds, through your sweated condition due to the exertion caused in rebuilding the fire. Meanwhile, your entire heating system becomes cooled, which means discomfort for all occupants of the household, also subjecting all to possible contracting of some sort of illness.

THE demands of HEALTH and the elimination of COLDS, and all INCONVENIENCES prevalent during the early SPRING, late FALL and WINTER months, when heating is a problem, can be adequatey taken care of in a scientific manner by the installation of a GEIST HOME HEATER, automatically controlled and designed on the basis of economy and efficiency.

THIS HEATER will absolutely, without question, heat your home equally as well as your present coal furnace, take care of the demands of health to a point, and will pass the COAL FURNACE and CELLAR into OBLIVION, thereby eliminating forever the possible dangers of ill health and those many inconveniences to be had where coal is used as a heating commodity.

GAS FUEL cannot be surpassed or equalled as a commodity, when used for purposes pertaining to COOKING, LAUNDRY WORK and heating HOT WATER—one time a problem, but now made a pleasure by the use of MODERN GAS APPLIANCES scientificaly constructed on the basis of economy and efficiency; and no MODERN HOME APARTMENT HOUSE, HOTEL, RESTAURANT OR CAFE is complete unless thoroughly PIPED throughout for GAS.

MODERN GAS APPLIANCES are meeting with great favor in the hotels, restaurants, cafes and homes, and it remains only a question of time when all obsolete gas and coal appliances will be replaced by those of the modern type.

LAUNDRY work is made a pleasure by the use of an up-to-date laundry stove, and the ironing likewise through the aid of a gas iron, which cost less than 1c for three (3) hours.

HOT WATER can be had for the cleansing of dishes, baths, etc., at the low cost of 1c for ten (10) gallons.

HEATING of offices, stores, business places of all kinds and homes, where individual or auxiliary heating is required, same can be adequately cared for by the use of GAS HEATERS, specially adapted for each individual case.

GAS never fails, a commodity always there when needed, never fully appreciated until consumers find themselves minus said commodity for a short time, due to some stoppage in the house piping, fixtures or appliances.

WE are maintaining for your service a NEW BUSINESS DEPARTMENT to answer all questions pertaining to the betterment of service, and we cordially invite you to make a personal inspection of our SHOW ROOM, where you will find efficient and courteous attendants who will gladly define the proper appliances needed for the particular case.

COMMUNICATIONS on all Gas matters will receive prompt attention.

3625 **Commercial Department** 3625

ATLANTIC CITY GAS COMPANY

2001 ATLANTIC AVENUE

COMMERCIAL DEPARTMENT OF ATLANTIC CITY GAS COMPANY GETS UP EFFECTIVE COPY FOR GAS APPLIANCES FOR ADVERTISEMENTS

War Savings Sales Near Billion Mark

Including cash received in the Treasury Department on Oct. 21 from the sale of War Savings securities, the total Treasury receipts from this source amounted to $801,453,415.86. This represents the purchase of War Savings stamps to the total maturity value of approximately $950,824,474.10.

J. D. Forest Discusses Three Ways in Which the Elimination of the Kaiser May Be Brought About

J. Dorsey Forrest, general manager of the Citizens Gas Company, of Indianapolis, Ind., whose statements and articles pertaining to the various phases and progress of the war with Germany and Austria have become widely known in Indiana, has just contributed another article that is timely to the press in Indiana on the subject "The Elimination of the Kaiser."

In the article he discusses the three ways in which the final elimination of the Kaiser from the government of the German people may be brought about, and the deep knowledge from which he speaks has made his article already the subject of much favorable comment.

The article follows in full:

"In recent weeks public attention seems to have been directed more to the elimination of the German Emperor and to German constitutional reform than to the victories of the Allied armies and to the great issues of the war. From the day of his address to Congress advocating a declaration of war down to the present time President Wilson has never failed to draw a sharp line of distinction between a wicked German government and a good German people. None of the Allied statesmen, none of the soldiers in the field, none of those who have studied the sentiment of Germans at home or the frightful acts of the German armies in occupied Allied lands seem to share the President's views on this subject. Nevertheless, the universal hatred of the German system causes a natural interest in the question of the destruction of its head; hence the general diversion of public interest from the real issues of the war to one of its by-products.

"In order to understand fully the bearing of this movement on the real

issues of the war it may be well to consider the various ways by which the German Emperor may be eliminated, and the probable consequences of his elimination. There are three ways by which he may be removed: Abdication, constitutional amendment, and revolution. I invite attention to each of these possibilities.

Abdication

"The German Emperor as such cannot abdicate. The constitution provides that the president of the German union shall be the King of Prussia. William II cannot resign as Emperor. By his own act he can give up that office only by abdicating as King of Prussia.

"The papers have contained many reports that the King of Prussia had abdicated or was about to do so. First it was reported that he had abdicated in favor of Eitel Frederick, his second son and his supposed favorite, who is also the favorite of the German people. Then it was reported that he had abdicated in favor of his grandson, the minor son of the Crown Prince, and that the Emperor's brother, Prince Henry, was to be named as regent.

"These reports were probably thrown out as feelers to test sentiment both in Germany and here. The Crown Prince Frederick William could hardly be suggested, for he is unpopular in Germany and everywhere else; but Eitel Frederick might have been thought of as likely to rally the German people to his support, while Prince Henry had been so well received when he visited the United States that it may have been thought that he would be acceptable here.

"Eitel Frederick is a fat beast who might be liked by the people of Germany, but could never appeal to the Americans; and Prince Henry, though popular with the turnvereins, mannerchors and German houses which he did so much to organize for kultur and the fatherland, is a junker of the deepest dye and was so recognized by many Americans who met him when he came here to abuse our hospitality.

Part of the Peace Drive

"These reports of abdication were doubtless part of the German peace drive, but were never meant seriously. And for a very good reason: the King of Prussia cannot abdicate in favor of anybody. He may abdicate, but the Prussian constitution determines his successor. That instrument provides that the crown shall be hereditary in accordance with the royal house laws, which were adopted as a part of the constitution in 1850. Under the constitution the resignation of the King would place the Crown Prince on the throne. Of course, the latter might abdicate in turn and thus throw the succession, and therefore the presidency of the union, to his young son. There would be no legal way to put Eitel Frederick on the throne. But the accession of the Emperor's minor grandson would still leave it impossible for either his father or his grandfather to name Prince Henry of Prussia as Regent. The constitution provides that in event of a minority the adult male next in succession shall assume the regency. In this case it would be Eitel Frederick, and he would act as King of Prussia and Emperor of Germany until his young nephew should come of age, which would be when he became eighteen years old. It therefore appears that abdication presents no way to rid Prussia of the present Hohenzollern brood. If William should step down, his oldest son would succeed him; and if the latter should abdicate, his brother would become Regent of Prussia and Acting Emperor of Germany. It is hard to see how the world would benefit from such a change.

Constitutional Amendment

"The removal of the present Emperor, or even of his whole family, from office or succession may be accomplished by an amendment to the German constitution. As I have pointed out in some previous discussions, the constitution is amended in exactly the same way that any law is enacted, except that fourteen negative votes in the upper house defeat a constitutional amendment, while a bare majority in each house carries an ordinary law. The Emperor, as King of Prussia, has absolute control of the seventeen Prussian votes in the upper house; so that an amendment removing him from office and establishing a different presidency for the Empire could not be adopted without his consent. Such an amendment could be defeated by a combination of the rulers of several other German states, and some of them would probably object to such a change about as strongly as the King of Prussia himself would do. If the Kaiser is eliminated by constitutional amendment, it is clear that he must legislate himself out of office. With his fanatical belief that he is the Lord's anointed, and his love of place and power, it is hardly likely that William Hohenzollern will take that step.

Revolution

"There remains the possibility of elimination by revolution. Of course, a revolution is always a possibility. There are mutterings of revolution in Germany, though reports of them are probably exaggerated. But the German people have never shown any capacity for revolution. They tried it in 1848 and made an utter failure of it because they had no capacity for self-government. The best elements of the nation then tried to revolt and to organize a liberal constitutional government, but failed because of lack of political capacity. It was not because of the armies of their rulers, for these did not suppress the rebellion until the rebels had failed to organize a practical mode of resistance after the first successes. I do not believe that the Germans of today have any more political capacity than those of 1848 had, and they have none of the idealism and love of free institutions which those revolutionists had imbibed from France. If a revolution occurs in Germany at this time there is grave danger that it may be a revolution of Bolshevism. I doubt whether the Germans would disintegrate as the Russians have done. But at the present time such revolutionary mutterings as we hear come from classes which would be likely to become mere destructive mobs, and not the revolutionists who could form a new state on firm foundations of liberty and order.

Danger to Allies' Interest

"When I speak of the 'danger' of a destructive revolution I do not do so out of sympathy for the Germans themselves, but with consideration for those whom the Germans have wronged. It is not in the interest of France and Belgium and Serbia that anarchy should reign in Germany, for a just peace requires the payment of enormous damages by the Germans. It is necessary that the

people of Germany should work for many years to pay their debts to these wronged nations. In addition to sending to the plundered factories as much useful German machinery as is available, the Germans will have to work for many years to pay for the devastation wrought in the occupied lands. After sending nearly the entire output of the German coal mines to France for the next five years to supply the French people while they are repairing the wanton destruction to their mines, the Germans will have to work for many years to pay for the millions of tons of coal they stole from the mines before they were driven away.

"Admirers of Bolshevism and doctrinaire statesmen may think that a revolution in Germany would be a great victory for democratic principles, but the first consideration of the civilized world should be justice to the Allied peoples.

"Furthermore, a revolution in Germany, especially if artificially produced by our demands, would be no guarantee for the future good conduct of the Germans. It would doubtless be followed by a reaction and the appearance of a strong man, and the Germans would come to regard their misfortune as due to the internal disorders rather than to military defeat. The original formula of peace put forth by the British Government cannot be improved upon: 'Restoration, restitution and guarantees for the future.' The restoration of all stolen lands, the payment as far as possible for all damages wrought on land and sea, the complete disarmament of Germany, the trial and execution or life imprisonment of the Emperor, the Crown Princes of Prussia and Bavaria, and of all others responsible for crimes in violation of international law—these steps will do far more to prevent a renewed outbreak than any destructive revolution or dictated constitution could possibly do.

No Dictated Constitution

"History records no case where a constitution or form of government has been successfully imposed upon one people by another. Even the voluntary adoption by one people of the institutions of another has often proved a failure. The holy alliance sought to impose reactionary institutions on the nations of Europe, and the allied conquerors of Napoleon did impose a constitution and a king on the French. The revolutions of 1830 and 1848 swept away all vestige of Prussian and Austrian institutions which had been established in other countries. The imposition of a democratic constitution upon Germany by external demand would be as unjust and impracticable as the imposition of a reactionary constitution upon France after the downfall of Napoleon. If it is done, history is likely to put Wilson in the same class with Metternich. A liberal German constitution is quite likely to grow on German soil if the Allies impose just conditions of peace and take wise precautions against a revival of German military and economic aggression; but it should grow out of German historical institutions, and is not likely to bear much resemblance to the Constitution of the United States.

"If we were confronted by a military power which we could not break by military victory we might be justified in overthrowing Germany by attempting to incite a revolution at home, as Germany did in Russia, though such methods would be abhorrent to most people in the Allied countries except a few of the Creel school. But if Germany's military power could not be broken by the Allied armies no revolution at home would be possible. With a military victory none is needed. On the other hand, proper restitution to Germany's victims can scarcely be obtained if a violent revolution occurs, while the future welfare of the chastened German people requires that they should be allowed to work out their own constitutional and other internal reforms—after they have been properly chastened.

"A dictated peace is the only safe and just ending of the war, but a dictated German constitution would be unwise and unsafe, both for the German people and for the world."

Charcoal Made from Peach Pits

Workers at Astoria Gas Defense Plant Turning Collections from Big Drive to Good Use

Workers at the gas defense plant, Astoria, N. Y., are receiving large quantities of peach pits and nuts for the manufacture of gas masks, as a result of the drive to obtain these materials.

The peach pits are converted into charcoal, because they form a charcoal precisely adapted to use in the processes of gas-mask manufacture. Apricot, prune, and plum pits are satisfactory, as are cherry stones, date seeds, Brazil nut, hickory, butternut, and walnut shells, but other nuts must not be mixed with these because they do not make a suitable charcoal.

Additional Issue of Louisville 7 Per Cent Notes Offered

An additional issue of $228,000 Louisville (Ky.) Gas & Electric Company bond secured 7 per cent notes, due Sept. 1, 1920, is being offered at 98⅛ and interest, yielding over 8 per cent, by Bonbright & Company, Inc., H. M. Byllesby & Company, Inc., and Wakefield Company (of Louisville). The issue is in the main to provide funds for additions and extensions to meet demands for power from war industries

Fuel Saving by Industrial Plants

Through the co-operation of the industrial power plants, which have thus far put into force the standard recommendations of the United States Fuel Administration to promote efficiency in the use of fuel in power plants, a saving of seven million tons annually has been effected. That is to say, in the first six months from the announcement of the National program, three and one half million tons have been conserved, at the same time maintaining maximum production in the factories. The largest savings have been in the following states: Massachusetts, Pennsylvania, Connecticut, Illinois, New York, Missouri, Michigan, Minnesota, and Winconsin.

Some industrial plants which have adopted the standard recommendations and kept systematic records report a fuel saving as high as 25 per cent, and the average is estimated between 10 per cent and 15 per cent. This large economy is effected at practically no expense to the plant owner since the recommendations treat primarily of proper methods of firing and management in power plants.

One manufacturing plant in Abbeville, S. C., writes the Fuel Administration that as a result of the installation of the improvements and records recommended, "We show for the first eight months of this year a fuel saving of over 25 per cent as compared with the same eight months last year."

A fuel Administration campaign

comprehends voluntary service by engineer inspectors, lectures to fuel conservation classes in educational institutions, addresses before public meetings, explanations of the program to power plant owners, and various forms of printed matter and posters.

For the efficient execution of the program of industrial conservation, under the plan developed, the engineers of the country have been mobilized through the professional societies and the operating engineers and firemen, and as a result there are today fifteen hundred volunteer engineer specialists and power plant men organized by states, inspecting power plants, classifying them according to their operating efficiency, and aiding the work of rapid development. As a direct result of the operation of this plan, it is estimated that the total annual saving throughout the country will be about 25,000,000 tons without reducing the output of the factories. Special printed material instructing on the proper use of fuel has been prepared by the United States Fuel Administration and may be obtained free of cost upon application.

The campaign has been organized in consultation with the State Administrators, the Bureau of Mines, and the Committee of Consulting Engineers of the Engineering Council, which represents the four National engineering societies. These four societies have contributed largely in supplying expert advice of engineering talent; special relations have been formed between the Fuel Administration and the National Association of Stationary Engineers, the International Brotherhood of Stationary Firemen and Oilers, the Laundryowners National Association, the Portland Cement Association, and other national bodies who have given full co-operation to this national plan.

Commission Hears Petition of Attleboro Company to Increase Rates

The hearing on the petition of the Attleboro (Mass.) Gas Light Company for an increase in the price of gas was held in the council chamber recently before the State gas and electric light commission. No specific price was indicated, but comparisons were shown to prove that Attleboro's rate of $1.15 is lower than that of other cities. There was no opposition to the proposed increase. No decision was made by the board.

Independence Company Files Petition for Increase

The Jackson County Light, Heat & Power Company, which supplies Independence, Mo., with artificial gas, has filed with the state public service commission at Jefferson City an application for the right to increase its rates 20 per cent. The gross rates proposed are $1.45 per 1,000 cu. ft. for the first 5,000 ft., $1.30 per 1,000 cu. ft for the second 5,000 ft., and $1.15 per 1,000 cu. ft. for all over ten thousand feet, subject to a discount of 10 cents per 1,000 ft. for prompt payment of bills. The minimum monthly bill would be 75 cents net.

San Diego Rate Increase Hearing Postponed

The hearing before the state railroad commission of the application of the San Diego (Cal.) Gas & Electric Company for permission to revise its rates for gas and electric energy, has been postponed from Oct. 25 to Nov. 27.

Increase in Gas Rate Granted River Gas Company

The state utilities board has allowed an increase to the River Gas Company, Marietta, Ohio, in the rate for the domestic use of natural gas, effective Nov. 10. The present rate is 25 cents per 1,000 ft., with reduction for cash of two cents, making the rate 23 cents net. The new rate will be slightly higher, going to 28 cents, with two cents off for cash, making the net rate 26 cents. That means an increase of 3 cents over the old rate.

The rate increase affects Marietta, Belpre and Newport.

Increased Rate Asked for Rockford, Ill.

The Rockford Gas Company has asked the State public utilities commission to grant an increase in its rates. The company now is charging a maximum of 95 cents per 1,000 cu. ft. and is asking a flat increase of 25 cents, making the rate $1.20. The minimum rate, that enjoyed by large consumers only, is 40 cents per 1,000 ft. The company also wants an increase in this rate.

A. S. B. Little, former chief engineer of the utilities commission, and now employed as an expert, said he thought the increase asked is entirely too much. He said he thought a fair rate to be $1 per 1,000 cu. ft. for small consumers and 60 cents for large consumers.

The matter has been placed before Walter A. Shaw, member of the utilities commission, who has taken it under advisement.

Massachusetts Commission of Standards Compiles Thrift Folders into One Pamphlet

A very new and interesting feature in gas advertising are the thrift folders which have recently appeared. The National Commercial Gas Association was looking for something along this line, and hired Mrs. Helen Ruggles of Chicago, who compiled six thrift folders on the following subjects: (1) useful utensils; (2) bread baking; (3) fish from market to meal time; (4) meat and how to make the most of it; (5) vegetable economy; and (6) household fats. The National Association sold these folders to gas companies all over the country, and they distributed them to their customers. The Massachusetts Commissioner of Standards thought so highly of them that he had the six folders collected and issued as one pamphlet.

In this day and age such a series of lessons in gas economy and general thrift is especially laudable. The commissioner of standards prefixed a brief statement explaining that the pamphlet is especially devoted to helpful suggestions to housewives in carrying out the wishes of Hoover and Garfield to save food and fuel. The series is decidedly practical, and in keeping with the spirit of the times. For example, in the section devoted to useful utensils there are given twelve ways in which people waste gas, followed by this statement—"Large gas bills are often due to wrong utensils. Try it out."

The folder on bread baking gives first some helpful hints as to what constitutes good bread, then it discusses the food value of bread in conjunction with other foods and then gives recipes for various kinds of bread, in each case stating fuel costs for baking.

This is the model for the other folders; a section on helpful hints; a discussion of the food in ques-

tion; and finally recipes. In one of them a section is given to the care of the gas range. Again we are told why slow cooking is an advantage, and why it is not necessary to have the gas on to its fullest capacity to secure the best results.

The pamphlet teems with information showing that people can use gas economically and with great benefit to themselves. The commissioner of standards will gladly mail copies of this pamphlet to anyone upon application.

Personal Notes

JAMES F. POWERS, has been appointed officer manager of the Worcester Gas Light Company, 240 Main Street, Worcester, Mass., to succeed John B. Callahan, cashier, resigned. Mr. Power has been with the company about 15 years, and for some time had been in charge of the information department.

JOHN B. CALLAHAN has resigned his position as cashier of the Worcester (Mass.) Gas Light Company. Mr. Callahan has been with the company about 25 years, beginning as a clerk when the office was at 33 Pearl Street. For many years he was employed as a collector, later returning to the office, where he was a clerk until his promotion to the post of cashier several years ago.

THE NORTH SHORE APPLIANCE COMPANY opened a store at 182 Shirley Avenue, Revere, Mass., Nov. 1, where a complete line of gas and electric appliances is shown. Branch offices are located at Columbia Square, Winthrop, and 150 Beach Street, Revere. Arthur L. Gardella, manager, was formerly employed by the Suburban Gas & Electric Company and subsequently by the Lynn Gas Company where he specialized on gas water heaters.

C. NESBIT DUFFY has resigned as vice-president of the Manila Electric Railroad & Light Company, Manila, P. I., to accept the position of vice-president of the Visayan Refining Company, Manila, P. I., one of the largest cocoanut oil companies in the Philippine Islands. Mr. Duffy assumed his new duties on Nov. 1.

J. C. ROCKWELL, the present general manager of the Manila Electric Railroad & Light Company, has been placed in full charge of the affairs of the Company in Manila by the J. G. White Management Corporation, New York, N. Y., the operating managers of the property, due to the resignation of C. N. Duffy.

LOUIS LOCK, a native of Russia, but a resident of the United States for the past twenty years, who went to Little Rock, Ark., eight years ago from El Dorado, died Oct. 25 at Fort Worth of pneumonia. He was mainly responsible for the development of the Monroe gas field, and was recently granted a franchise by the city of Little Rock to supply gas to that city.

Survey to be Made of Maryland Gas Companies

After a conference with the Assistant Director of the Bureau of Standards, at Washington, Assistant Engineer Charles G. Edwards, of the Public Service Commission, has notified the Public Service Commission that a survey will be made in Maryland of the various gas and electric light plants with a view of ascertaining the chances for the conservation of fuel and oils in the manufacture of gas and electricity. This survey will probably not be made of the Consolidated Gas and Electric Company, of this city, as all information on the subject of the consumption of coal and oil has been fully laid before the Public Service Commission at a recent hearing. In this connection it has been stated that the Public Service Commission will not give a decision in this matter until the Bureau of Standards, at Washington, has definitely determined what B.t.u. should be established as a standard.

Construction Notes

Empire Companies Plan Boiler Conservation Plant

For the conservation of worn out boilers, the Empire Gas & Fuel Company will shortly start the erection of a complete boiler plant at Oil Hill, Kan. It will be another measure of conservation. It is planned to to rebuild every boiler at a minimum cost, and it is anticipated that not a single new one will have to be bought for several months.

The shop building itself will be 30 by 94 feet and will be located directly south of the larger, modern machine shop. It will have every modern mechanical device that is used in any of the large shops of the country. Great cranes will be used in lifting the boilers from one portion of the shop to another, power punches will be installed, air compressors and every device that is necessary for an up-to-date shop.

The corrosive effect of water has been especially bad in Butler County and it has been necessary to install new flues in boilers after a comparatively short time. The new shop will have devices to re-weld the flues and save the purchase of new ones.

Work Started to Increase Capacity of Manitowoc Plant

Work started Oct. 23 at the plant of the Manitowoc (Wis.) Gas Company to increase the capacity of the plant from 240,000 cu. ft. of gas every twenty-four hours to 300,000 cu. ft.

H. H. Letson, of South Haven, Mich., is taking active charge of the improvements. A fifth bench will be added, with a capacity of 60,000 cu. ft. of gas every twenty-four hours, and which, with the four benches now in use, will take care of the demands for the coming summer.

Consumers experienced some trouble the past summer with gas, particularly in the hour just preceding noon, and just before 6 o'clock in the evening. The company was up against it, being unable to provide sufficient gas to care for the needs of the consumers.

Manager Eastman realized that additional gas-producing equipment was needed and took the matter up with the head offices of the company, with the result that the material and machinery for increasing the capacity of the Manitowoc plant was ordered.

This additional equipment is now available.

The Wisconsin Rate Commission in a ruling just given approves the additions to the plant and allows the company the actual cost in adjust-

ment of its valuation to cover the additions, which are made chiefly to meet the demands of the United States Government in supplying the 100 new houses which are going up at the Riverview addition, west of the hospital.

It is not likely that the company will receive any increased rate of service on the addition at this time, although with the increased valuation the company may be in a position to demand such increase later.

The company has been hampered in its service for several months past.

New Orleans Company Will Build Gas Line If Flow from New Well Warrants

New Orleans, La., will get natural gas without issuing more bonds, according to W. E. Lawrence, secretary-treasurer of the Orleans Oil & Gas Corporation, if the corporation's second well, now being drilled, produces sufficient gas to warrant the investment of private capital in a pipe line from the gas fields 20 miles south of Houma for New Orleans.

The New Orleans corporation has leases on 23,000 acres at the southern stretch of Bayou Terrebonne. The well brought in for it last May, which is within 800 ft. of the Terrebonne Gas Company's wells, is estimated at 90,000,000 cu. ft. The Terrebonne company is the McCormick-Thatcher concern.

"The New Orleans corporation and its immediate connections are able to finance a pipe line," said Mr. Lawrence. "The pipe line will be built by them if they get sufficient gas to warrant it. The present indications are that the gas will be produced."

$200,000 Improvements to Be Made at Portsmouth

Company Will Supply Cottages of Government Workers

The Portsmouth (Va.) Gas Company and the United States Housing Corporation, have reached an agreement as to the improvements to be made in the gas plant so as to supply sufficient gas for the government settlements of Paradise Creek and Villa Heights. This will require the laying of about eight miles of pipe and the purchase and installation of much new machinery. The cost of the improvements will be in the neighborhood of $200,000.

Central Indiana Company Secures Permit to Lay Pipe Lines in Muncie

Permission to cut the streets and lay pipe lines to certain manufacturing plants in Muncie, Ind., was given the Central Indiana Gas Company by the board of public works recently, after the board had spent considerable time discussing the advisability of the move in view of the fact that the service company is petitioning for a higher rate for manufactured gas and is said to be intending to furnish natural gas to the factories at the old schedule of rates.

In a talk before the board and Fred B. Tracy, manager of the gas company, President Andrews of the board said he was opposed to granting the permit unless some assurance was given that the improvement when completed would not lessen the possibility of domestic consumers being given priority consideration. Mr. Tracy promised that the homes would be better protected in this respect than at this time in that if the new lines are laid the company will be able to turn the supply of gas off from the factories without depending on them to do so when the supply runs low. The permit was granted on this assurance and the further one that the construction mentioned will not entail an expenditure of more than $2,500.

Massachusetts Gas Earnings

In view of the influenza epidemic in September the earnings statement of the operating companies of the Masachusetts gas companies was not a good reflection of the actual earnings of the properties because of the inability to read all the meters. As a result of this the total net earnings of the sub-companies showed a decrease of nearly $100,000 from the August figures, thus making the fourth consecutive month that a falling off has been recorded. As compared with a year ago, however, the September figures made a better showing as the decrease was less than $50,000.

For the nine months of the current year, the net shows an increase of $415,769 or over 11 per cent, the total amounting to $4,092,361 as against $3,676,592 in the corresponding period of last year. How the net has varied each month is shown here:

	Net	Increase Over Prev. Month
September	$403,140	*$98,014
August	501,154	52,614
July	448,540	*30,597
June	479,137	*129,164
May	608,301	16,562
April	591,739	171,285
March	420,454	131,365
February	289,089	*39,721
January	328,810	162,379

*Decrease.

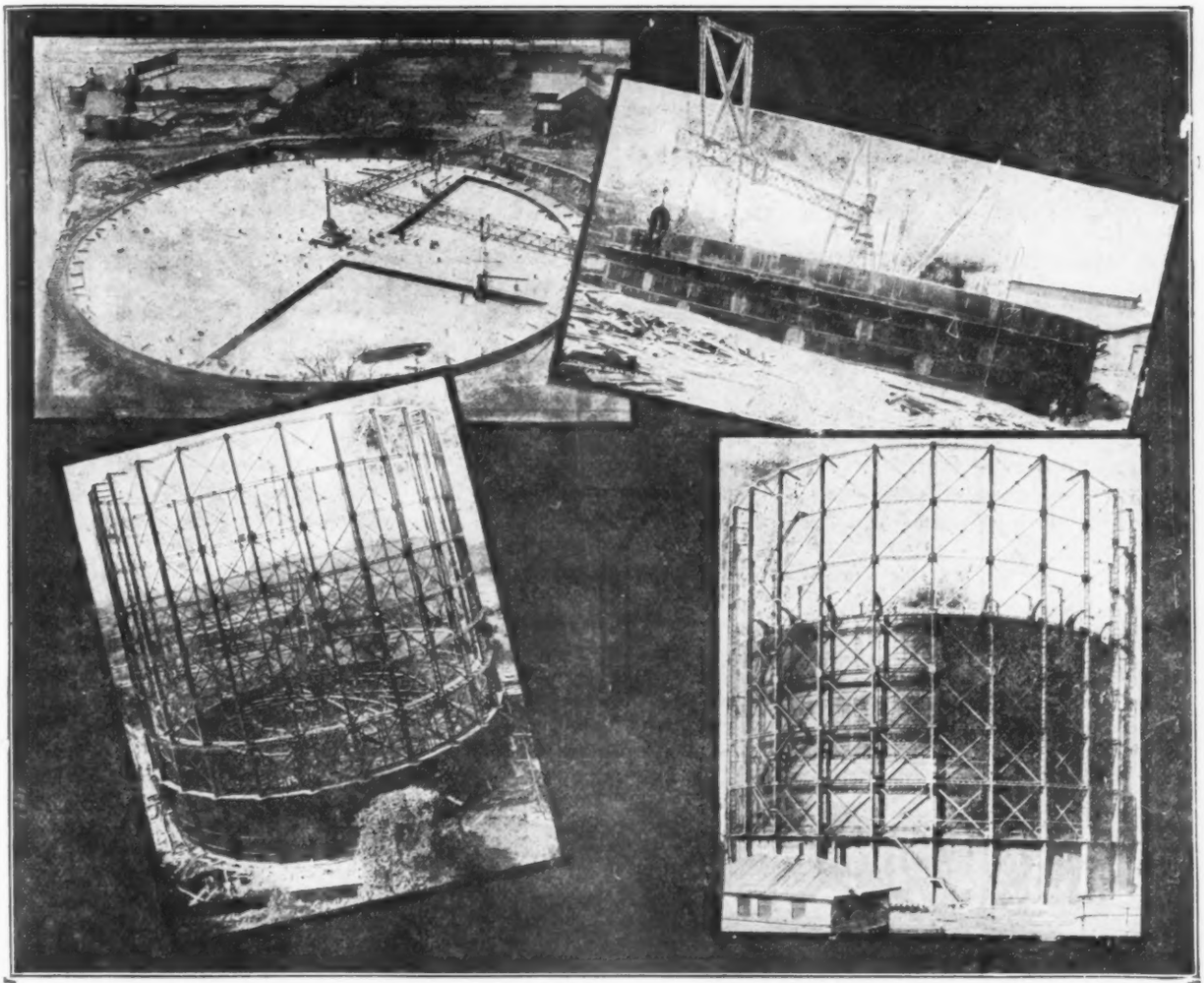
The interesting feature of the earning statement is that while the returns from gas have shown a little average change, the miscellaneous returns have shown a remarkable expansion. In 1914, for instance, the miscellaneous income was less than $1,000,000 for the nine months. This year the nine months net amounted to $3,214,052, or about 250 per cent larger. As compared with last year the miscellaneous income shows an expansion of nearly $700,000 or over 27 per cent. Most of this expansion comes from the coal business and the earnings of the New England Manufacturing Company, and the returns from the latter are bound to be large while the war lasts.

THE PORTLAND (ORE.) GAS & COKE COMPANY reports September gross $173,504, inc. $54,483; net after taxes $81,364, inc. $26,909; surplus after charges $51,707, inc. $25,236; twelve months, gross $1,668,764, inc. $340,327; net after taxes $752,213, inc. $135,645; surplus after charges $400,688, inc. $114,909.

THE KANSAS GAS & COKE COMPANY reports September gross $171,346, inc. $57,539; net after taxes $56,230, inc. $19,418; surplus after charges $23,403, inc. $11,850; twelve months' gross $1,982,697, inc. $267,089; net after taxes $624,936, inc. $128,772; surplus after charges $271,659, inc. $27,562.

THE OHIO CITIES GAS COMPANY declared the usual quarterly dividend of $1.25 a share, payable Dec. 1 to stock on record Nov. 15.

THE COLORADO GAS & ELECTRIC COMPANY gross earnings for September were $835,824, an increase compared with September, 1917, of 14.07 per cent; net earnings, $382,921, an increase of 15.20 per cent; surplus, $186,561, an increase of 27.52 per cent. For nine months the surplus was $2,511,348.



RITER-CONLEY COMPANY

STEEL CONSTRUCTION

PITTSBURGH

GAS PURIFYING MATERIALS

NATRONA RED ORE
To Be Mixed With Fluffing Material

MINERAL SPONGE
The Best Fluffing Material

MINERAL SPONGE OXIDE
Prepared for Use

PENNSYLVANIA SALT MFG. CO.
WIDENER BUILDING
PHILADELPHIA - - - - - - - PENNA.

With The Equipment & Appliance Manufacturers

Conducted by Business Department of American Gas Engineering Journal

A Specially Designed Barrow for Charging Retorts

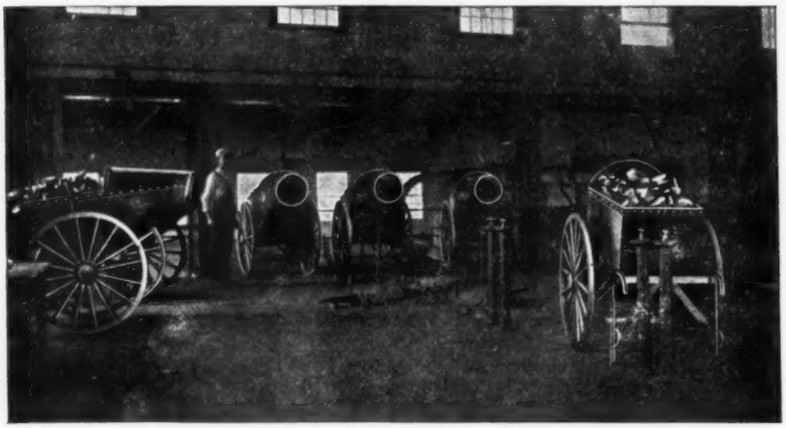
The Akron Cultivator Company, Akron, Ohio, makes a large assortment of steel barrows for all sorts of uses. The one of special interest to gas companies is their McNeil Patent Balanced Automotive charging barrows, designed for charging retorts, especially where the retorts are filled from a floor overhead. The illustration shows a battery of these barrows in use at the Twentieth Street Works of the Omaha Gas Company, Omaha, Neb.

The box is supported on a carrying-frame, and turns on gudgeons at the side of the box, thus moving independently of the frame. A lug on the box engages with a trigger on the handle frame, holding them securely together. The frame is so constructed that when attached to the box it holds firmly and prevents the box tipping forward when the trigger is unhooked. The weight of the box is thrown on the frame so as to absolutely prevent its falling into the hopper.

The large wheels make it very easy running, and the frame allows the centre of gravity to be placed very close to the wheel centre, which gives it a long leverage, and much greater stability in motion. The box is so placed that it does not spill in the gangways, and when dumping, the nose just passes the hopper rim, permitting the whole load to run out.

It is fitted with round chute on the front which fits into the charging holes of the retorts, and pours in its load without losing a pound. When the firing floor is below the charging floor so that the hot coke can fall into the barrow from a chute, this barrow is equally convenient. A load of 1000 lbs. of hot coke can be handled by one man.

These barrows have been tested up to a gross load of 3700 lbs. which one man can haul, and with perfect safety from spilling. Their catalog illustrates completely the many uses this barrow can be put to around a gas plant and is sent on request.

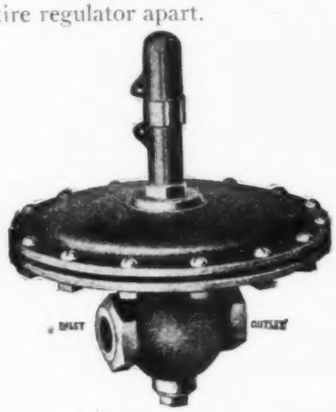


BATTERY OF M'NEIL BARROWS

House Service Regulator

All house regulators are designed to reduce to a low pressure whether connected to a high or low pressure service. They operate with entire safety regardless of what the inlet pressure may be, up to 500 pounds, and to regulate at one reduction to the lowest pressure desired.

The illustration shows a Fulton House Service Regulator. In this regulator the valve is opened by a spring instead of a lever and weight. The valve has a renewable seat and makes a tight joint. The valve seat can be replaced quickly, and both the valve and valve seat can be taken out and replaced without taking the entire regulator apart.



FULTON REGULATOR

This house regulator is designed to reduce any intake pressure up to 100 lbs. to a delivery pressure of a few ounces.

This is one of a large number of gas regulators for all purposes manufactured by the Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.

Fireclay & Silica Products

In a catalogue recently issued by the Missouri Fire Brick Company, St. Louis, Mo., they describe the various kinds of fireclay and silica products manufactured by them. Among these are listed coal gas benches, both horizontal and inclined, gas retorts, settings, etc.

This catalogue can be obtained from the company upon request.